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Low Income in Canada: a Multi-line and Multi-index Perspective

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Low Income in Canada: a Multi-line and Multi-index Perspective

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Executive summary

Objective

There is sustained interest in finding out in broad terms how many poor people are in Canada, how poor they are, what their characteristics are, where they live, and how long they stay poor. Statistics Canada does not define 'poor' nor does it estimate the number of poor families and individuals in Canada. However in recognition of the need for a statistical portrait, Statistics Canada has for 40 years been publishing statistics on Canadians with low-incomes, which is a key dimension of poverty. The primary purpose of Statistics Canada's low income lines are to provide some indication of the extent, nature, and evolution of persons with low-income who may be said to be at-risk of poverty.[1]

International practice has shown that using a number of different low-income thresholds can facilitate a more complete picture of the low-income population and this report examines three such lines: Statistics Canada's after-tax low income measure (LIM) and after-tax low income cut-off (LICO), and the Market Basket Measure (MBM)of Human Resources and Skills Development Canada (HRSDC). None of these lines is considered definitive and all have their strengths and limitations. Together they allow a more complete examination of the low income population in Canada.

This report uses these three thresholds applied to the Survey of Consumer Finances (SCF) and the Survey of Labour and Income Dynamics (SLID) to present and examine broad trends in the low-income population over a 34 year period from 1976 to 2009, with particular attention given to the changes between 2007 and 2009. The report examines the incidence (rate), gap ratio (depth), severity and persistence of low income for Canada as a whole and across different provinces, cities, family types, as well as for specific groups with a high risk of persistent low income.

Canada overall

Over the past 34 years low-income individuals have accounted for as much as 16% of the population and as little as 9% depending on the time period and low-income line used.

In the year 2000 the estimates of the size of the low income population were similar for the three low-income thresholds -- the Low Income Cut-Offs (LICO), the Low Income Measure (LIM) and the Market Basket Measure (MBM). The LIM estimated 3.8 million persons with low income compared to 3.7 million under the LICO and 3.6 million under the MBM.

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1. The imprecise and to some degree arbitrary operationalization of poverty concepts coupled with the statistical variability of surveys and the essentially political nature of such estimates render it inappropriate for a Statistical Agency to make such judgements (Fellegi, 1997) . The low-income statistics are not intended to provide an indication of the success or failure of specific programs designed to assist the poor.

Between 2000 and 2007 the low income population decreased by over 500,000 individuals under the LICO and MBM while it increased by 500,000 under the LIM. This is because the LICO and MBM thresholds are determined at a given point in time while the LIM threshold is always determined by the current population. Thus the results indicate that while the low income population is smaller than in the past under the LICO and the MBM, at the same time the incomes of those in low-income have not increased as much as has the median income according to the LIM.

Between 2007 and 2009 this long downward trend in low income incidence under the LICO and MBM levelled off and in some cases began to reverse itself. The levels in 2008 and 2009 under the LICO and MBM are marginally higher than in 2007 but represent the second lowest annual rates of the past 34 years. Despite a statistically insignificant change in LICO between 2007 and 2008 and again between 2008 and 2009, on balance a series of more sophisticated tests indicate a slight upward trend in low-income during that time.

Low income across socio-economic groups

The incidence of low income varies across groups of individuals such as seniors, children, persons living in lone parent families (lone parents), recent immigrants, off reserve Aboriginal persons, persons with activity limitations, and non-elderly unattached individuals. Many of these individuals have been shown to have an increased risk of persistent low income (Burstein, 2005). Not all of these groups of individuals followed the same pattern as we saw for Canada as a whole.

Lone parents
Lone parents experienced a significant long term decrease in the incidence of low-income between 1996 and 2009. The low-income rates among lone-parents fluctuated between 40% and 50% for more than 20 years from 1976 to 1996 according to both the LICO and the LIM lines. From 1996 to 2009 the rates dropped sharply from 50% to around 20%. Interestingly this trend of lower rates for lone parents was preceded by a lessening of the gap ratio and severity of their low-income starting in the mid 1980's.

Despite a slight overall increase in low-income in Canada between 2007 and 2009, low income for lone parents did not increase between 2007 and 2009. Rather, it continued to decline in a trend started in the mid-1990s and coincided with an increase in the labour market attachment of lone parents. As such the trend in low income among lone-parents was different from that of the overall population. This decrease was accompanied by growth in the relative size of the service sector in 2008 which tends to employ more women than men.

Seniors
For twenty years from 1976 through the mid-1990s the low income rates for seniors declined continuously and significantly from over 30% to less than 10% under both the LICO and LIM resulting in large part from increased pension income and government transfers. The rate continued to decline from 1996 through 2007 under the LICO (5 percentage points drop) and MBM (1 percentage point drop from 2000 to 2007) while it increased by about six percentage points under the LIM. This indicates that since 1996 seniors have continued to make progress

relative to the 1992 distribution of income and the market basket but that they have lost ground relative to the incomes of non-seniors. This is also reflected in the fact that the growth in non-seniors median income was faster than that for seniors after 1996 while before 1996 senior's median incomes were increasing relative to non-seniors. Between 2007 and 2009 there was a small increase in the low-income rate for seniors under all three lines. Similar small increases were experienced by seniors during the recessions of the early 1980s and 1990s.

Children
The general trend in low income incidence for children largely followed the national trend from 1976 to 2009[2]. Despite a statistically insignificant drop in incidence under the LICO, the rate, gap ratio, and severity all increased slightly under the LIM and MBM between 2007 and 2008. Between 2008 and 2009 the LICO rate then decreased further while the rate increased marginally under the LIM and more substantially under the MBM.

Unattached non-elderly
Sustained high incidences of low income in excess of 30% occurred for the unattached non-elderly from 1976 to 2009. The 1990's saw a decade long peak of the low-income rate reaching almost 40% coinciding with high unemployment in this group. Since then the rate has fallen back to about 35% under all three lines. A small increase was noted between 2007 and 2008 that was experienced equally between males and females. This was followed by a small decrease under all three thresholds between 2008 and 2009.

Recent immigrants
Low income among recent immigrants was a relatively low 10% in the late part of the 1970s and increased through the 1980's to about 20% and peaked in the mid 1990's at close to 30%. It has declined since then to drop below 20% by the year 2005 and this drop was coincident with increases in weeks worked. In 2006 and 2007 an upward trend in the low-income rate for new immigrants was observed under the LICO and LIM while their low-income rate under the MBM continued to fall. All three lines registered increases in the incidence of low income between 2007 and 2008 and then remained roughly stable in 2009.

Off-reserve Aboriginal persons
Between 1996 and 2009 the low income rate of off-reserve Aboriginal persons dropped more than 10% from a high of nearly 30% in 1996. The rate under the LIM has been stable since 2000 while the rate under the LICO and MBM has continued to fall. Between 2007 and 2008 the rates were stable or falling slightly however they went up under all three lines between 2008 and 2009 driven largely by a decrease in labour market activity.

Persons with activity limitations
Between 2000 and 2009 the low income rate of persons with activity limitations dropped about 3 percentage points under the LICO and 2 percentage points under the MBM while the rate increased 2 percentage points under the LIM. This would suggest that those with activity limitations are gaining ground against fixed standards but their median incomes are losing ground relative to the current incomes of other Canadians.

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2. A child is considered in low-income if they are living in a family or household whose income is below the threshold.

Provinces and metropolitan areas

Between 2000 and 2009 declines in the incidence and gap ratio of the low-income population occurred in the provinces of Alberta, Newfoundland and Labrador, Prince Edward Island and the cities of Edmonton and Calgary accompanying the economic growth in these areas during this period. There were significant improvements in low income for children and lone-parents in most provinces and cities in the past decade.   However, some subgroups of the population experienced higher than average incidences of low-income. For example, in Alberta, and especially Edmonton, where incomes improved dramatically, low income among lone-parents remained high.

Relative rankings of the low income population in 2009 by province are very difficult given conflicting signals between the three thresholds and four measures[3] and no definitive ranking is possible. However it is clear no province had statistically lower incidence, gap ratio or severity than Alberta in 2009. PEI was next and the reduction of low income in this province was also very strong from 1976 to 2009. Newfoundland and Labrador, Manitoba and Saskatchewan followed and it is difficult to differentiate between them. New Brunswick and Nova Scotia followed the above provinces in the low-income comparison and the low-income situation was slightly better than in Ontario. Quebec and British Columbia had the highest incidences of low income among the provinces.

Persistence

A significant proportion of annual low income is of a transitory nature in Canada. One third of those who fall into low income leave low income the following year. While the remaining two thirds remained in low income the following year, very few of them (less than 1.4% under the MBM, 2.1% under the LICO and less than 3.5% under the LIM) would be low income for six years or more.

Still, more than 20% of Canadians experience low income sometime in a six-year period. For persons who experienced low-income during the 2002-2007 period the average time in low-income was about 2.4 years. (2.3 years under the MBM, 2.4 years under the LICO and 2.5 years under the LIM). This represents a slight decline in persistence under the LICO and stable persistence under the LIM compared to the 1993-1998 period.

Three groups of persons experienced low income in a more persistent manner than others. The most noticeable of them were lone-parents and unattached non-elderly persons and to a lesser extent, persons with activity limitations. These groups were the most likely to be in low-income for six years and once in low income, they would stay the longest. However their average persistence dropped by almost a full year over the past 15 years.   Moreover under the LICO the proportion in low-income continuously for six years dropped from over 20% to 6%.

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3. The four measures are incidence, gap ratio, severity and persistence of low income.

Low income persistence dropped significantly in Alberta, Quebec and the major cities in these two provinces in recent years. In Alberta in general, and in Edmonton and Calgary in particular, persistent low income became very rare. But the situation deteriorated in British Columbia, although the duration of low income did not appear to be particularly long in this province. On the other hand, relatively long spells of low income were found in the provinces of Newfoundland and Labrador, Nova Scotia and New Brunswick and in the city of Winnipeg.

Between 2007 and 2009 the proportion of low income Canadians exiting low income after one year decreased under the LICO and MBM and was stable under the LIM. At the same time the proportion of the population entering low-income increased under all three lines.

Chapter 1 Introduction

While there is a continuous demand for poverty estimates, Statistics Canada does not estimate the number of poor households, families or individuals in Canada. The imprecise and to some degree arbitrary operationalization of poverty and the essentially political nature of such judgements coupled with the statistical variability of surveys render it inappropriate for a Statistical Agency to make such judgements (Fellegi, 1997). However having low income is a significant aspect of being poor and so for some years Statistics Canada has published estimates on the population with low incomes. Thus the primary purpose of Statistics Canada's low income lines is to provide some indication of the extent, characteristics, and evolution of persons with low-income who may therefore be seen to be at-risk of poverty. It is not a precise determination of the number of people in poverty in Canada.

This report uses data from the Survey of Consumer Finances (SCF) and the Survey of Labour and Income Dynamics (SLID) and three different low-income lines to present and examine broad trends in the low-income population over a 34 year period from 1976 to 2009, with particular attention given to the changes between 2007 and 2009. The report examines the incidence, gap ratio, severity and persistence of low income across different provinces, cities, family types, as well as for specific groups with a high risk of persistent low income.

While many different low income lines have been used in Canada for many years (Wolfson 1989, Scott et al. 2008), Statistics Canada has historically focused on describing changes in the low-income population using its Low Income Cut-Off (LICO). Given the arbitrary elements inherent in any low-income line and a lack of consensus on the 'best' low income line, this report makes use of multiple low-income thresholds and is consistent with international best practices. Multiple low-income indicators are also employed to try to identify, verify, and qualify broad trends in the low-income population.

Chapter 2 presents an examination of the evolution of the incidence, gap ratio and severity of low-income at the national level from 1976 to 2009. This chapter examines differences between signals from the three low income thresholds employing advanced statistical techniques. This chapter concludes with a focus on changes between 2007 and 2009.

Chapter 3 examines whether the broad national trends identified in Chapter 2 accurately describe the experience of individuals and groups that have been identified as having a high risk of persistent low-income and social exclusion (HRSDC, 2009). The groups examined are children, seniors, persons living in lone-parent families, unattached non-elderly individuals, recent immigrants, off-reserve Aboriginal persons and persons with activity limitations.

Chapter 4 then examines low income across the ten provinces as well as seven census metropolitan areas from 2000-2009. Each of the low-income lines employs a different methodology and set of assumptions regarding the sub-national measurement of low income. This can make ranking of the provinces difficult and this is illustrated with an attempt to rank the provinces in 2009. The section includes a look at the groups of persons at risk of social exclusion for each geographic area.

Chapter 5 then presents an examination of the mobility of the low income population using standard transition and persistence measures. The chapter addresses questions of how many people enter and exit low-income and how long people remain with low-incomes. It also introduces a new persistence measure that takes into consideration the changing depth of low-income.

The appendix of the report presents a short discussion of the purpose of low income lines and a description of the three low-income thresholds used in this report (Statistics Canada's after –tax Low-Income Cut-offs and after-tax Low Income Measure as well as Market Basket Measure of Human Resources and Skills Development Canada). The measures are compared in terms of their key dimensions and differences.

Chapter 2   Low-income trends in Canada

This chapter attempts to answer the question: what are the major trends in low income in Canada over the last few decades? At Statistics Canada, a historically consistent income data series allows us to examine low income over a period of 34 years, from 1976 to 2009. The period witnessed some important structural changes in the Canadian economy due to, most notably, the introduction of new information and communication technologies, the establishment and enlargement of the free trade zones, globalization and increasing international competition. The decades covered two complete economic cycles in which both GDP and employment contracted in absolute terms. A new contraction started in late 2008. It was also a period in which redistribution policies such as employment insurance and social assistance programs evolved dramatically. All of these changes have implications for low income and this is the first study that documents low income for such a long period using multiple measures and indicators.

The evolution of low income incidence: 1976 to 2009

The low-income rate, also referred to as the incidence of low-income, tells us what proportion of a population is living with an income that is below a given threshold.[4] Figure 2.1 presents the low income rate (left axis) for all Canadians from 1976 to 2009. It also shows how the unemployment rate (right axis, for Canadians aged 15 to 64 years old) evolved during that period. The figure suggests that while the low-income rates in Canada varied significantly over time, they roughly followed the ups and downs of the overall economy and sometimes low income measured by different lines tell somewhat different stories.

Figure 2.1 clearly shows that the low- income rates measured by fixed historical standards such as the Low Income cut-offs (LICO) and the Market Basket Measure (MBM) varied more over time than did the Low Income Measure (LIM) which is based on standards of current income distributions. Under LICO, the low-income rate reached a historical high of almost 16% in 1996, and about a decade later, a historical low of just above 9% was observed. There was also another pair of high and low points in low income rate under LICO: the 1983 high of 14% and the subsequent low of 10% in 1989. Both comparisons are statistically significant.[5] The MBM line has a relatively short history, but the historical low under MBM coincided with that under LICO. Under LIM, however, the historical low incidence coincided with the 1989 low of the LICO

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4. We use the after-tax income concept under LICO and LIM and the disposable income concept under MBM in this report. After-tax income is total household/economic family income net of income taxes and government transfers. The disposable income is defined as income available to purchase the goods and services that are contained in the MBM basket. In particular, MBM's disposable income = total income − income taxes − CPP/QPP contribution − EI contribution − RPP contribution − union dues − child/spousal support payment − work-related child care expenses − out of pocket medical expenses − public health insurance premiums.
5. Statistical tests for the period before 2000 are based on estimated standard errors with analytical formulae for the FGT indexes. For the period thereafter in which all three low income lines are available and on which our analysis was focused on, bootstrap weights from SLID were employed. A comparison of the results under the two approaches suggests that estimates using the bootstrap weights are more conservative. For example, low income rate under LIM in 2008 was significantly higher than that in 2007 under the first approach. But under the second approach, the difference was only marginal.

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and the low income rate under LIM in that year was significantly lower than it had been or would be for any other year during the last three decades.

Figure 2.1 Low-income rates and unemployment rate, Canada, 1976 to 2009
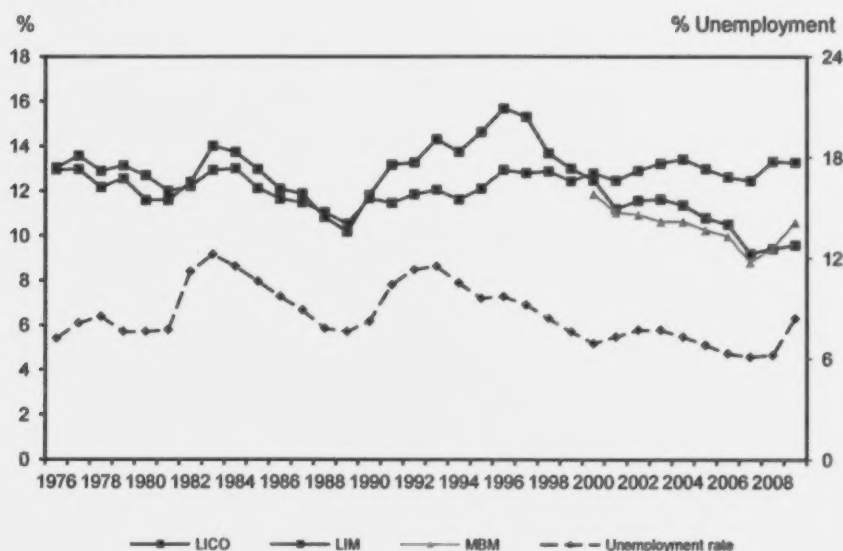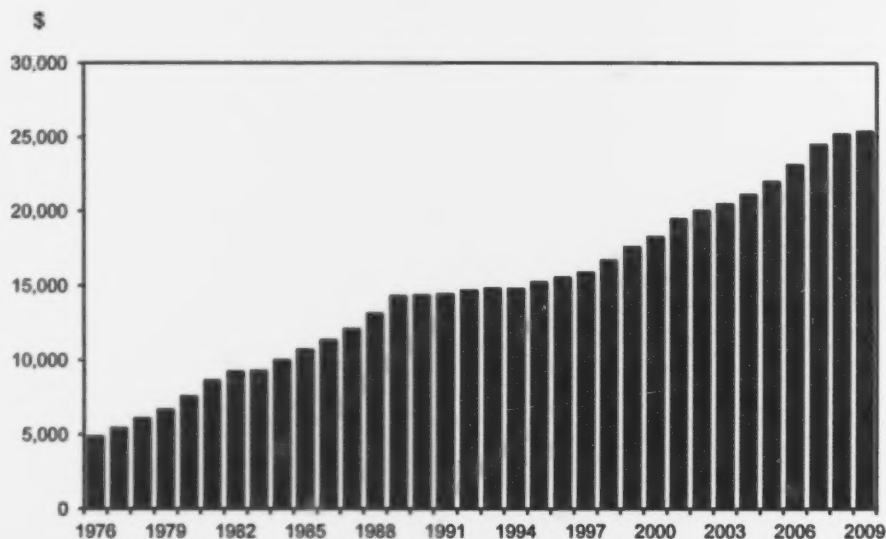

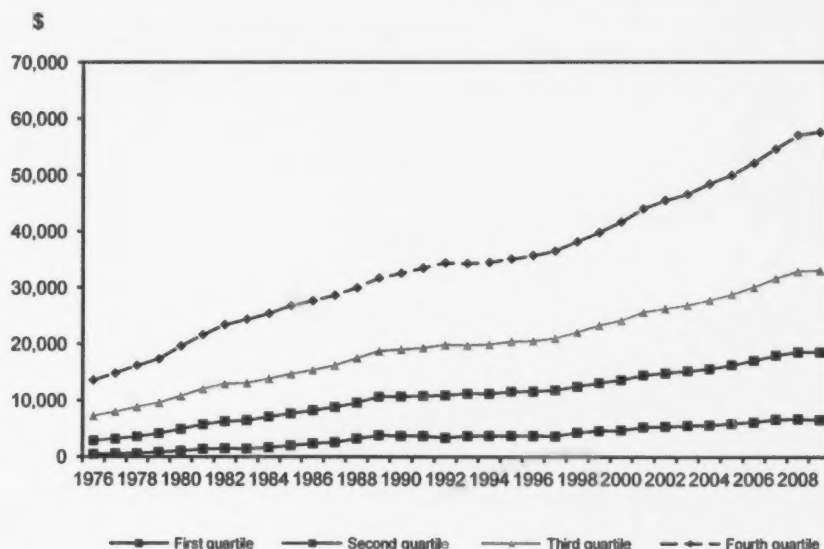**Source:** Survey of Consumer Finances (1976 to 1995), Survey of Labour and Income Dynamics (1996 to 2009) and Labour Force Survey (CANSIM Table 282-0002), Statistics Canada.

The short-term variations in the low-income rates appeared to follow business cycles closely. Before the year 2000, low income incidences measured by the LICO and the LIM seemed to evolve along the same path. This path coincided with changes in the unemployment rate. For example, the early 1980s recession was immediately followed by a high of low income incidence under both LICO and LIM, varying between 13 to 14% in the period of 1983-1984. It then dropped quickly to a low of 10% by 1989 under both lines.

However the variations in low income did not follow the variations in unemployment all the time. For example, from 1976 to 1981, low income rates declined while the unemployment rate fluctuated around 8%. Likewise, from 1993 to 1996, while unemployment rate dropped by almost two percentage points, low income rates under both LICO and LIM increased, and the increase in low income rate under LICO was more than one percentage point. These observations suggest that labour market is an important factor behind the evolution of low income incidence, but not the only one. The evolution of income, particularly the evolution of income at the lower end of the distribution is another important factor.

Figure 2.2 shows how individual after-tax income (in current dollars) evolved between 1976 and 2009. The figure indicates that change in income is an important factor behind the low income trend. We can divide the whole period into three sub-periods. From 1976 to 1988, the median after-tax income increased strongly. The annualized rate of increase amounted to 8.3%. But from 1989 to 1995, the median after-tax income increased only by an annualized rate of 1.1%. While from 1996 to 2009, the median increased by an annualized rate of 4.0%. This evolution of individual after-tax income coincided with the decline in the low income rates from 1976 to the late 1980s, the increase from the late 1980s to the mid 1990s, and the decline (at least under LICO and MBM) during the last decade.

Figure 2.2 Median after-tax income 1976 to 2009

Source: Survey of Consumer Finances (1976 to 1995) and Survey of Labour and Income Dynamics (1996 to 2009), Statistics Canada.

Figure 2.3 provides further details for the evolution of individual after-tax income by income quartiles. The income growth rates for those who were in the lower portion of the distribution were closely tied to the evolution of the low income rates. During the first sub-period (1976-1988), median after-tax income for those who were in the bottom quartile increased much faster than for those who were in the top quartiles. The annualized growth rates for the two groups were 16.8% and 6.6%, respectively. While for those who were in the second and third quartiles, the annualized growth rates were 10.1% and 7.3%. From the 1989 to 1995, median income for those who were in the bottom quartile actually declined slightly while that for the top quartile continued to increase at an annual rate of 6.1% and hence, the low income rates in this period increased. Finally, from 1996 to 2009, income in the bottom quartile again increased faster than

income in the top, at 4.4% and 3.7%, respectively. However, in this period, low income rates under LICO (and later under MBM) declined substantially, while rates under LIM did not, suggesting that there might be other factors at play.

Figure 2.3 Income growth paths by income quartile

One factor is the way low income is determined. The real values of the low income thresholds under LICO and MBM are fixed in time. The changes of those thresholds over time reflect purely the change in inflation. For example, the current LICO thresholds were set according to the 1992 consumption pattern. For the same person living in the same place in 1992 and 2009, the LICO thresholds were the same in terms of real values. They differed only by a nominal value. On the other hand, the LIM thresholds are updated each year according to the contemporary income distribution, and hence, when income increases, the threshold is automatically increased. However under the LIM current income is compared with a current standard, and as such the low income status of a person is independent of inflation.[6]

Figure 2.4 illustrates how average after-tax income and the LICO and LIM thresholds grew over time[7]. From 1976 through the 1990 all thresholds grew at similar rates and the LICO and LIM incidences followed a similar pattern (see Figure 2.1). The figure also shows how the Consumer

6. The assumption is that everyone faces the same prices
7. The mean threshold and income figures are calculated by averaging across individuals the value of the family threshold or income. The growth rates have been normalized to 2001. We performed robustness checks to confirm that the year of normalization did not bias the results shown here.

Price Index (CPI) evolved over time. Through the 1990s, the CPI grew faster than average incomes and consequently the LICO thresholds increased more quickly than the LIM thresholds, resulting in a sharper increase in low income rates under LICO than under LIM. However, starting from the late 1990s, median incomes began to grow faster than did the CPI and so the LIM thresholds increased faster than did the LICO thresholds. The result was a significant drop in the low income rate under LICO while the low income rate under LIM showed stability with a slightly upward trend.

Figure 2.4 Growth paths of average income and LICO/LIM thresholds (2001=1)
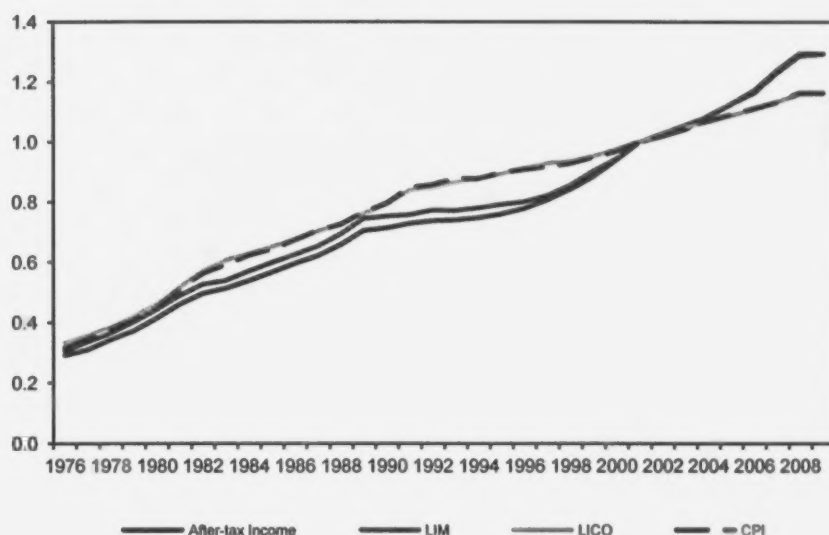
Source: Survey of Consumer Finances (1976 to 1995), Survey of Labour and Income Dynamics (1996 to 2009) and Consumer Price Index (CANSIM Table 326-0021), Statistics Canada.

Of course, the overall picture of low income incidence does not tell the whole story. On the one hand, there are other low income indexes that may provide us with additional information. This will be examined later in this chapter. On the other hand, the composition of the low income population may also change over time, and among those who were in low income, some might have done better than others. The evolution of low income for different groups of individuals, including those from different regions will be examined in later chapters.

Nevertheless, the evolution of the low income rates in 1976 to 2009 suggests that different measurement schemes may, at times, tell a different story. In particular, from 1996 to 2009, while the low income rates under LICO (and later under MBM) declined substantially, the low income rate under LIM did not change much. This raises the issue of how often one should rebase the low income threshold. If we use a fixed standard such as LICO, we are comparing the income of those who are in the lower part of the income distribution today with those who

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were in the lower portion of the distribution in 1992. In this way, we may measure progress against earlier situations. But if we use a variable standard such as LIM, each year we compare the income of those who are in the lower portion of the distribution today with those who are in today's middle. In other words the LICO and MBM tend to track change relative to past standards while the LIM tracks the low income population relative to the current distribution.

The report now turns to examine how low income changed following the latest recession.

How did low-income rates change during the recent recession?

Before the global financial crisis hit in 2008, Canada had enjoyed more than ten years of economic growth and rising employment. But the sudden reduction in world demand in the summer of 2008 quickly spread into the goods production and the labour market in Canada. Goods production posted the first decline since the 2000 recession; employment fell by 216,000 in agriculture, construction and manufacturing sectors in the last quarter of 2008. The situation deteriorated further in 2009. For example, the unemployment rate among Canadians aged 15 to 64 reached 8.4%--the highest level in the last decade. Given these, it is important to see what happened to low income during the recession.

Under the low income cut-offs (LICO), 9.4% and 9.6% of Canadians were in low income in 2008 and 2009, respectively (Table 2.1). Compared to the years from 2000 to 2006, the low-income rate in 2009 was significantly lower; but compared to 2007, the low-income rate under LICO increased by two-tenths and four-tenths of a percentage point in 2008 and 2009 but these changes are not statistically significant, as shown by Figure 2.5 (Panel A).[8]

However, as discussed before, LICO is only one of the available low income thresholds in Canada. What does the picture look like if we take a snap shot from a different angle? Let's examine low income using the Market Basket Measure first. Table 2.1 indicates that under MBM, the low-income rates in 2008 and 2009 were 9.5% and 10.6%. These are still significantly lower than that in 2000, but compared to 2007, the low-income rate in 2009 was significantly higher, while the low income rate in 2008 was not statistically different from that in 2007 (Figure 2.5, Panel C).

8. We determine statistic significance by the 95% confidence interval estimate of the low-income rate. When the interval estimates for two different years do not overlap, we say that low-income rates in these two years are significantly different, or the change in low-income rates between the years is statistically significant. If the intervals overlap completely, we say that change is not significant, and when they overlap somewhat, we would say that the change is only marginally significant. Notice that the SLID samples from the same panel and some of those from two adjacent panels are not independent and thus the estimated low income indexes are correlated. In this report, these situations are taken into consideration to ensure the validity of our inferences.

Table 2.1. Low income rates under different lines [n]

Year	LICO	MBM	LIM
2000	12.5%	11.9%	12.8%
	(0.28)	(0.26)	(0.27)
2001	11.2%	11.0%	12.5%
	(0.27)	(0.25)	(0.27)
2002	11.6%	10.9%	12.9%
	(0.28)	(0.27)	(0.28)
2003	11.6%	10.6%	13.2%
	(0.29)	(0.26)	(0.29)
2004	11.4%	10.6%	13.4%
	(0.29)	(0.27)	(0.30)
2005	10.8%	10.2%	13.0%
	(0.26)	(0.25)	(0.26)
2006	10.5%	10.0%	12.6%
	(0.28)	(0.26)	(0.29)
2007	9.2%	8.8%	12.5%
	(0.28)	(0.26)	(0.30)
2008	9.4%	9.5%	13.3%
	(0.29)	(0.25)	(0.33)
2009	9.6%	10.6%	13.3%
	(0.33)	(0.30)	(0.36)

n bootstrap standard errors (with 1000 bootstrap weights) are in parentheses

Source: Survey of Labour and Income Dynamics 2000 to 2009, Statistics Canada.

Under LIM, as can be seen from Table 2.1, the low-income rates were 13.3% in 2008 and 2009. This means that 13.3% of Canadians had an income below half of the median of the adjusted national income distribution.[9] The LIM threshold tells us how the income of an individual from the lower portion of the distribution compares with that of the individual from the middle of the distribution. It shows that the low-income rates increased by one eighth of a percentage point between 2007 and 2008/2009. But in this case, the change was not significant. Indeed, under LIM, annul low income rate remained virtually the same during the 2000-2009 period (Figure 2.5, Panel B).

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9. Please see the Methodology Appendix for LIM for detail.

Figure 2.5   The 95% confidence interval estimates of low-income rates under different lines
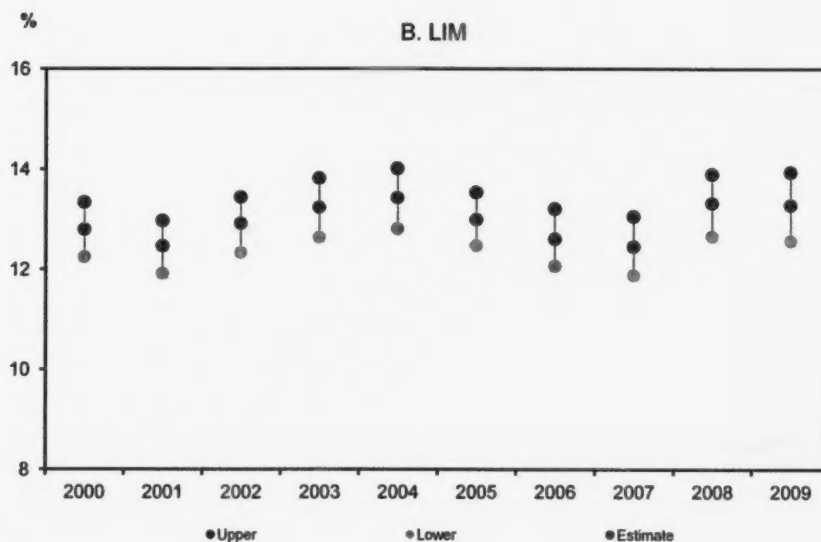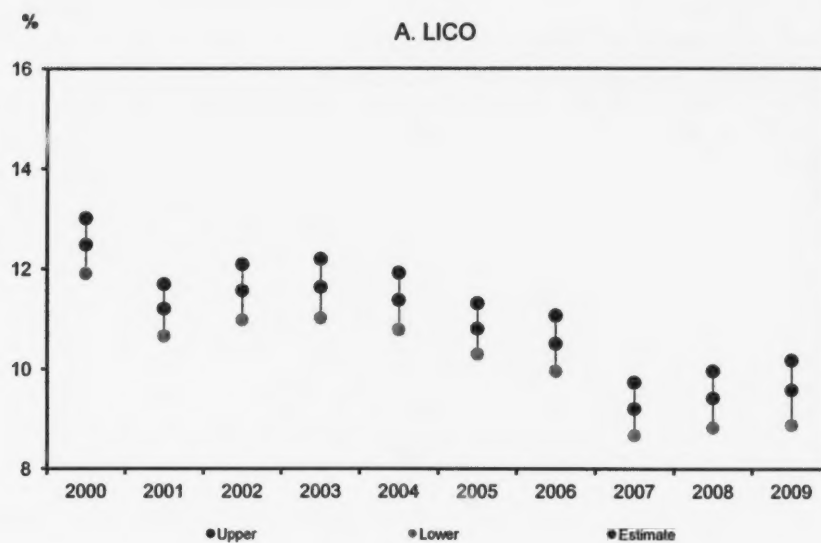
A. LICO

B. LIM

Figure 2.5   The 95% confidence interval estimates of low-income rates under different lines (continued)

C. MBM
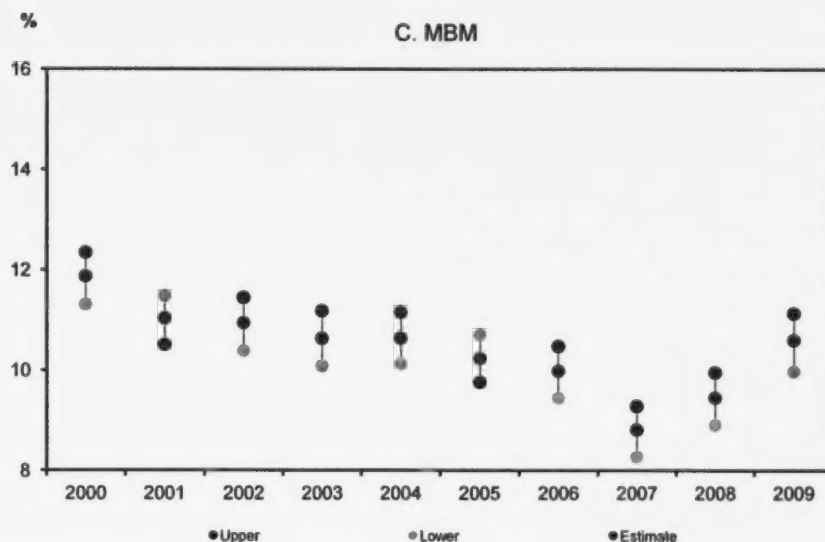
Source: Survey of Labour and Income Dynamics 2000 to 2009, Statistics Canada.

Apparently, different lines provide us with different answers to the question as whether low income increased, decreased or was unchanged in 2008/2009. If we were to rely on the traditional LICO line only, we would have inferred that the observed four-tenths of a percentage point increase in the low-income rates between 2007 and 2009 can be attributed to sampling errors and is negligible. But under MBM, we saw evidence that the low-income rates had increased in 2008/2009 and an upward trend in low income was emerging.

How robust is this inference? After all, the confidence interval estimates on low-income rates under LICO and LIM for the two years still overlapped, and since each low-income line is subject to its own assumptions and choices, it might well be the case that the estimated changes in the low-income rates under different lines were biased. To deal with this ambiguity, we need a more general tool. Instead of employing one or several thresholds, we consider a range of possible choices of low income thresholds and ask the question: how would the low-income rates change if the threshold is set at $1,000, $2,000, $3,000, ..., $30,000 per person per year? If, for a variety of reasonable thresholds, we also observe that the low-income rate in 2009 was higher than in 2007, we would be able to make a more robust conclusion.

We calculated low-income rates for 2007, 2008 and 2009 for low-income thresholds varied from $100 to $30,000 per person/year.[10] Figure 2.6 illustrates the estimated low-income rates for low-income lines ranged between $10,000 and $18,000. Our calculation shows that, for a range of low-income line from $11,000 to $17,000, the low-income rate in 2008 was higher than in 2007. That is, if it can be agreed that the low-income line should be set somewhere between $11,000 and $17,000, then we would be able to conclude that the low income rate increased between 2007 and 2008.[11] The figure also indicates that low income rate in 2009 was higher than that in 2007 if the low income line is set between 12,500 and 14,500 and between 15,000 and 17,000. There is, however, some ambiguity when the line is set between 14,500 and 15,000.

We conducted further tests using a series of variable low-income lines under the LIM methodology. We found that when the low income lines were set between 35% to 75% of the medians of the 2007 and 2009 income distributions, the low-income rate in 2009 was higher than in 2007, and the differences were statistically significant. Other tests show similar results.[12] Therefore, there is evidence to suggest that low income in 2008/2009 had a small increase relative to that in 2007.

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10. Income is measured in 2009 constant dollar. Household is used as the unit to determine the low-income status of an individual and the square root of household size is used as the equivalence scale. We also tested with economic family as the unit for low-income determination. The result is the same.

11. To give our reader some ideas for different lines, we notice that in 2008, the LIM threshold for a single person was $18,582; the LICO threshold for a single person living in an urban area with 500,000 or more residents was $18,373; while the MBM threshold for a person lived in Toronto was $15,565. Using CPI to adjust Professor Sarlo's threshold ($8,900 in 2000), one would obtain $10,644 for 2008.

12. Through stochastic dominance tests (with DAD 4.5 by Duclos, Araar and Fortin 2008), we found the 2007 distribution dominates that of 2009 in first order for thresholds blow $25,575. The 2007 distribution also dominates that of 2008 in first order for thresholds below $19,995 (all in 2009 constant dollars).

Figure 2.6   Low income rates in 2007, 2008 and 2009 under a range of low income thresholds

%

Incidence 2007 ———   lincidence 2008 — —   Incidence 2009 — —
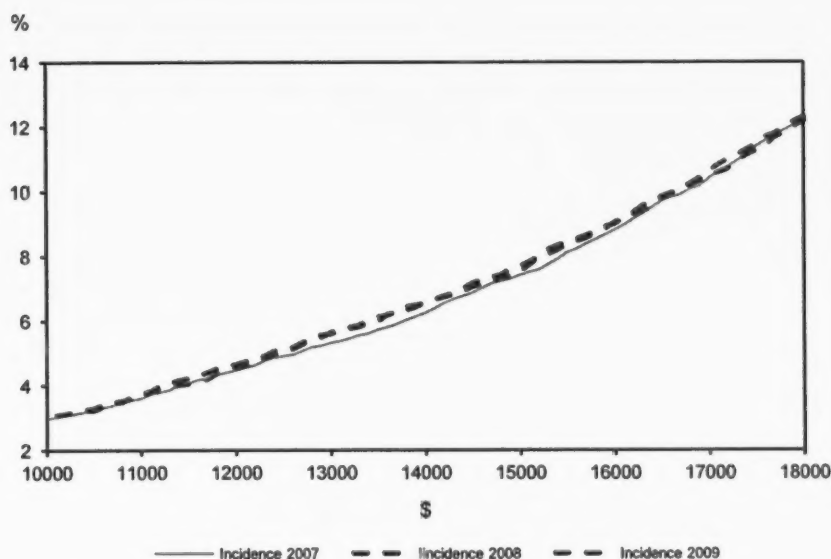
Source: Survey of Labour and Income Dynamics (2007 to 2009), Statistics Canada.

Our observations thus far are based on multiple low income lines. To be consistent with best practices, we also need to examine the evolution of low income with multiple indexes. The results are presented in the next section.

Low-income gap ratio and severity

The low-income rate is a very straightforward index and while simple to understand it has certain limits. For example, the inequality among low-income persons is also a concern for policy makers yet the low-income rate does not contain any information about that inequality. Indeed, "(S)ince the work of Sen (1976), taking into account inequality among the poor, and not solely the incidence or average intensity of poverty, has become common scientific practice".[13] The statement equally applies to studies of low income. To be consistent with best practices, this section examines how low-income gap ratio and severity have evolved in Canada.[14]

The evolution of the low-income gap ratio in Canada during the 1976 to 2009 period is presented in Figure 2.7. The figure appears to convey the same trend as that by Figure 2.1: the

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13. Duclos and Grégoire (2003).
14. Additional discussions on the low-income gap ratio and severity indexes can be found in the Methodology Appendix.

low income gap ratio changed in the same direction as the low-income rate in the whole period and the variations in the gap ratio under LICO were much stronger than under LIM.

Figure 2.7 Low-income gap ratios under alternative lines
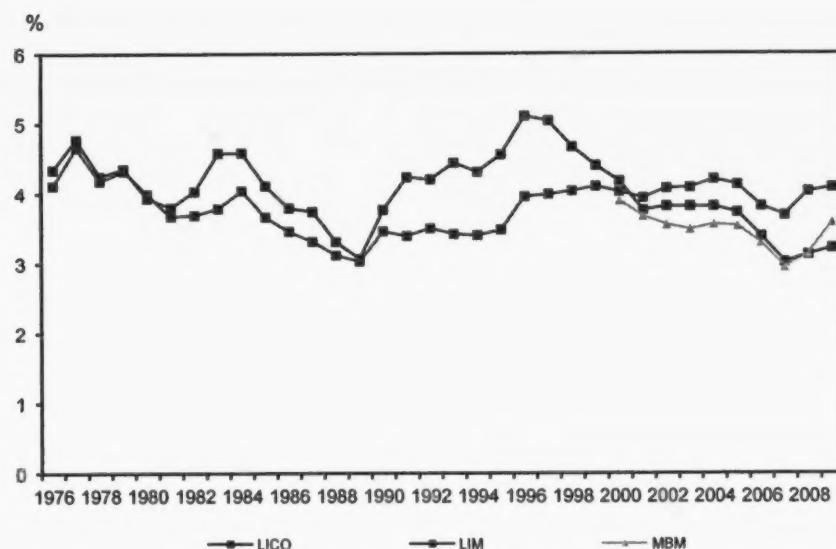
But some new insights can also be seen by examining the gap ratio statistics. For example, even though the low-income rates changed little in the years between 2001 and 2006[15], no matter which line was employed (Figure 2.5), when the gap ratio statistics are examined, the estimates suggest that the gap ratio in 2006 was significantly lower than in 2004 under LIM. The gap ratio was also significantly lower in 2006 than in 2001 under MBM, and more remarkably, the gap ratio in 2006 was lower than those in all the other five years under LICO. Consequently the stable low-income rate during this period appeared to be accompanied by reductions in the depth of low-income, and this is reinforced by the observation that the low income gap ratio declined under all three lines between 2000 and 2007.

Our results also show that the estimated low income gap ratios for 2009 (and to a certain extent for 2008) under both LIM and MBM were significantly higher than those in 2007. This corroborates our earlier finding that the low income rate in 2009 increased relative to 2007.

The low-income severity index measures how unequal low-income persons are between themselves. One measure of this is the square of the gap ratio. Under this index, low-income persons with large income shortfalls contribute more than low-income persons who have

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15. The confidence interval estimates largely overlapped each other in these years.

smaller shortfalls. In addition to the monotonic axioms, the index satisfies the transfer axiom: other things being equal, a transfer of income from one low-income person to anybody with higher income must increase the severity of low-income.[16]

Figure 2.8 Low-income severity indexes under different lines, Canada
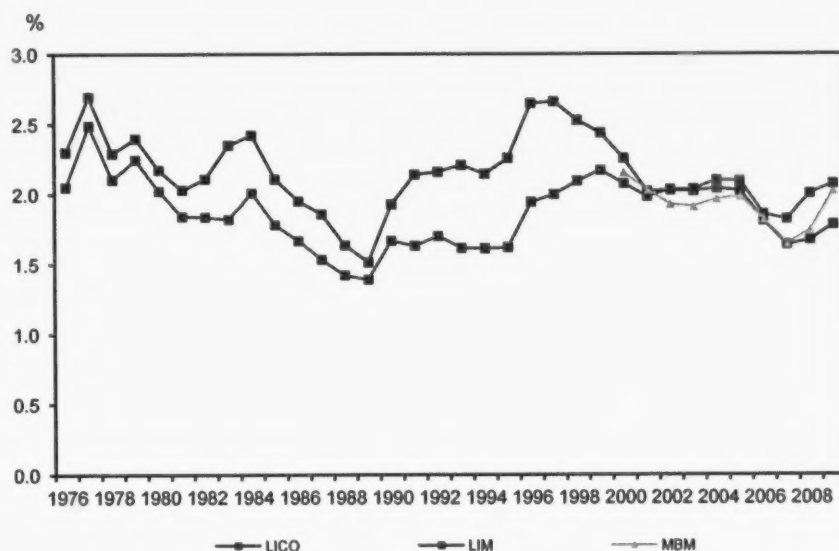
To understand the measure of severity, consider an extreme case in which we take away an amount from a person with the lowest income and transfer the money to a person who is just below the low income line, but the amount transferred is not large enough to lift the recipient out of low income. Such a transfer would not change the low-income rate or the gap ratio, but the low-income severity index would increase and hence it is the severity index that will be able to capture the increase in inequality among low-income persons.

The evolution of low-income severity indexes from 1976 to 2009 is presented in Figure 2.8. The general trend in low-income severity indexes under different lines is similar. They generally declined from 1976 to 1989, then increased until the mid to late 1990s and decreased again thereafter. The latest declining trend started to reverse in 2008, confirming the emerging upward trends in both the low-income rate and the gap ratio statistics discussed earlier. As in the case for the low-income gap ratio, we also found that the severity indexes in 2009 were significantly higher than in 2007 under both the LIM and the MBM, but not under the LICO.

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16. The axiomatic approach is pioneered by Sen (1976) and examined by many authors in the poverty literature.

Interestingly, we found that, under LIM, low income severity indexes in 2006 and 2007 were all significantly lower than in 2000, 2004 and 2005. This is in sharp contrast to the finding that low-income rates under LIM remained unchanged in the 2000 to 2009 period. These results demonstrate the importance of examining different low-income indexes in order to obtain a fuller picture of individuals' well-being.

Summary

From 1976 through 2009 the low-income rate, gap ratio and severity indexes under the three low-income lines varied significantly, but they generally evolved along the same cyclical trend. However, trends in low-income rates under different lines sometimes diverged. In particular, for the 2000-to-2009 period, we found the low-income rate declined under LICO and MBM, the fixed standards, while under LIM, the relative standard, no statistically significant change was observed. This would suggest that progress was made against a historical standard but that relative to current populations, low income incidence was stable. On the other hand, the evolution of the low income gap ratio and the severity indexes suggests that the well-being of Canadians from the bottom of the distribution had improved under both fixed and relative standards before the start of the recent recession.

Did low-income increase in 2008/2009 relative to 2007? Our results show that if a single line such as the LICO is employed, the answer would be no. But by examining multiple lines and multiple indexes, a more complete picture emerged. Our analysis indicates that an uptick in low income occurred in 2008/2009, and results based on more general statistical tests confirmed that the low-income rate increased slightly between 2007 and 2008/2009 under a range of possible low income thresholds.

Chapter 3 Low income across groups of people

In Chapter 2, we drew a picture of low-income Canadians living in the ten provinces. We found that low income improved considerably over the 2000 to 2009 period when it was measured by fixed standards. Also, the depth and severity of low income declined from 2000 to 2007, even under a variable standard, but there was evidence to suggest that an upward trend in low income may have started to emerge in 2008. Do these findings accurately describe the developments of well-being for different groups of people? This chapter attempts to answer this question.

People can be classified in several groups. When classified by age, low income among children and seniors may be examined. When classified by family status, low income among persons living in lone parent families (lone parents) and unattached people may be investigated. When classified by race and immigration status, low income among new immigrants and off-reserve Aboriginal people may be examined. This chapter provides results of investigation into low income based on classifications by group.

Children

There is significant interest in the well-being of children in Canada, so we begin by looking at low income among children.[17] Figure 3.1 contains the estimated low-income rate and gap ratio for Canadian children from 1976 to 2009. Low income among children can be characterized by two periods of upward movement and two periods of downward movement. From the late 1970s to the early 1980s, the low-income rate increased by about 3 percentage points under both the low-income cut-off (LICO) and the low-income measure (LIM). This was followed by a period in which the low-income rate declined by 3 percentage points under LIM and 4 percentage points under LICO. The second period of upward movement started in the late 1980s and lasted until the mid-1990s. This was followed by a prolonged period of improvement in low income that lasted about 15 years, to 2007. The decline in low income among children was particularly strong according to the two fixed standards, LICO and the market basket measure (MBM).

Low income among Canadian children has several interesting characteristics. First, low income among children, at times, was rather high. For example, in 1997, the low-income rates for children were as high as 17% and 18% under LIM and LICO, respectively, much higher than the 13% and 15% experienced by working age adults. However, overall the low-income rate among children was lower than the rate for people in several other vulnerable groups.

Second, low-income measures among children under different lines were quite close to each other until the late 1990s. Moving into the 2000's, different lines gave somewhat different results. In particular, low income under the LIM was stable during the 2000 to 2009 period, while low income under LICO and MBM continued to drop during this period. Under LICO, the low-income rate dropped by five percentage points, from 14% in 2000 to 9% in 2009, while under

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17. Children are defined as those persons 17 years old or younger.

MBM, it dropped by four percentage points, from about 14% in 2000 to 10% in 2008. But under LIM, the low-income rate for children was basically unchanged over the same period.

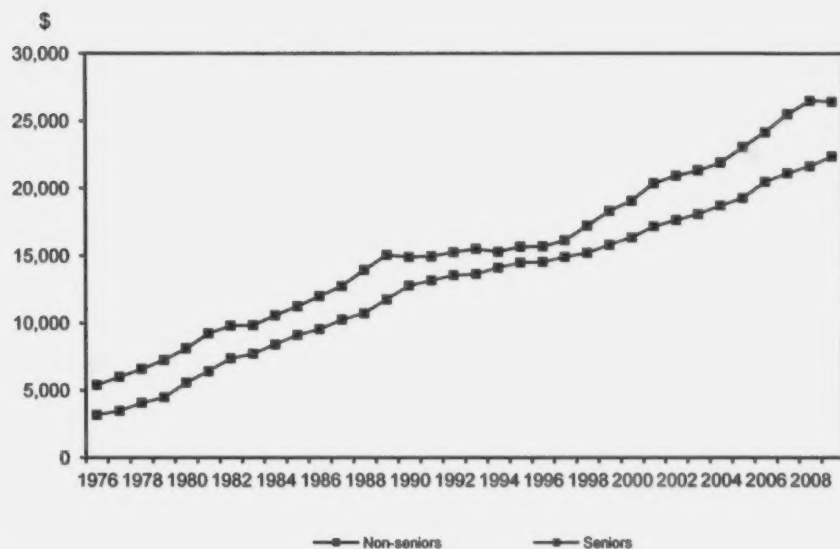**Figure 3.1   Low-income rates (top panel) and gap ratios (bottom panel) for children**
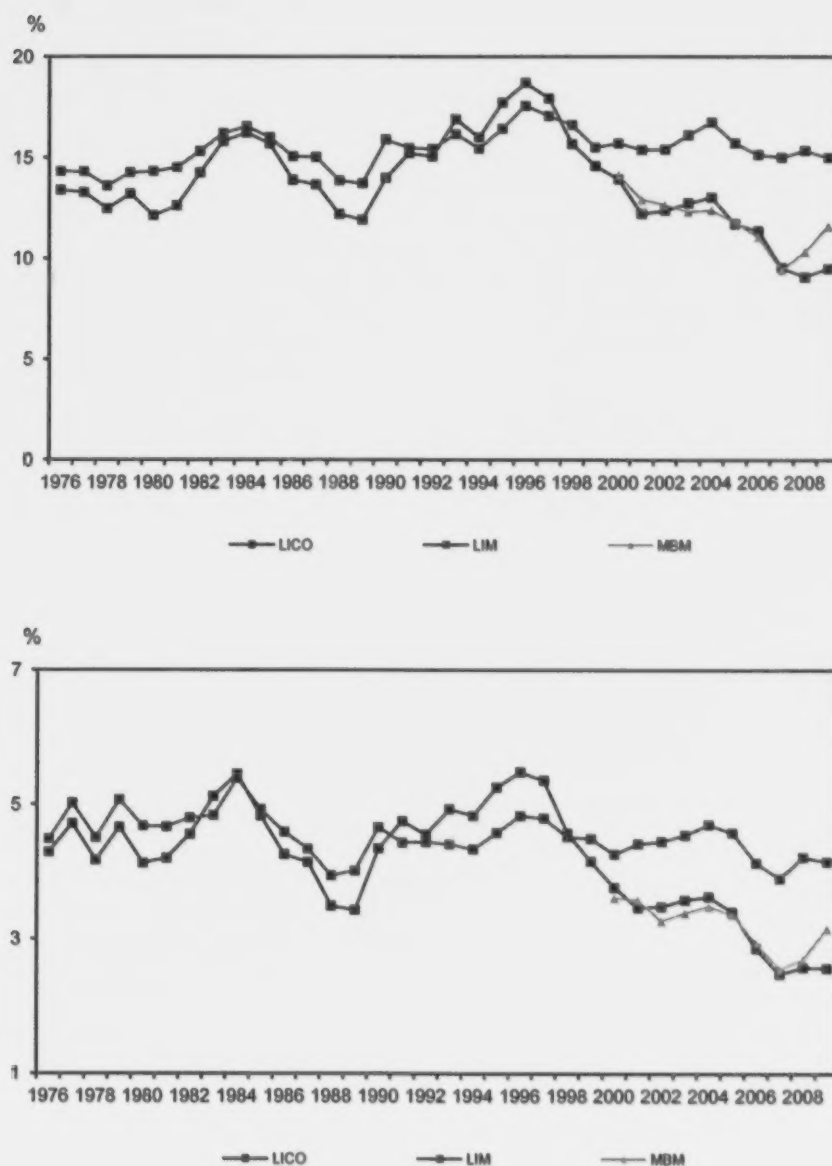
Source: Survey of Consumer Finances (1976 to 1995) and Survey of Labour and Income Dynamics (2000 to 2009), Statistics Canada.

Third, the short-term variations in low-income rates under different lines from 2007 to 2009 drew our attention. From 2007 to 2008, the low-income rate under LICO dropped by half a percentage point. However this is likely not indicative of an increase in the economic well-being of Canadian children during that time. On the one hand, the decline in the low-income rate was not statistically significant.[18] On the other hand, the estimated gap ratio (bottom panel, Figure 3.1) and severity (not shown here) under LICO actually increased slightly. In other words, the "decline" in the low-income rate under LICO was not supported by movements in the gap ratio and severity indexes under the same line.

In contrast, the number of children in low income under MBM and LIM went up in 2008. This upward movement continued in 2009 under MBM while falling back slightly under the LIM. As can be seen in Figure 3.1, the low-income rate for children under MBM increased from 9.4% in 2007 to 10.3% in 2008 and to 11.6% in 2009, with low income rate in 2009 being higher than that in 2007 with marginal significance.

Seniors

There has been a long term decrease in low income among seniors (65 years old or older) since the late 1970s. Figure 3.2 shows that dramatic declines in low-income rates for seniors occurred from the late 1970s to the mid 1990s under both LICO and the LIM. We also detected similar trends in the low-income gap ratio and severity indexes for this period under LICO and LIM. However, the low income trends under different lines started to diverge in the mid 1990s. Under LICO and later under MBM, low income continued to follow a generally declining trend. Under LIM, however, low income started to follow an upward trend.

Nevertheless, the upward trend in the low-income rate under LIM is probably not indicative of a serious worsening of the low income situation for seniors. On one hand, the low-income rate under LICO continued to decline in recent years. For example, under LICO, the low-income rate for seniors declined from about 10% in 1995 to about 5% in 2007. On the other hand, our calculations (not shown here) suggest that other low-income indexes were relatively low, no matter which low-income line was employed. The gap ratios were always under 2%, while the severity indexes were generally below half a percentage point, far below those for the overall population (Figures 2.7 and 2.8).

However, the development in seniors' low income between 2007 and 2009 is worth noting. Compared with 2007, seniors' low-income rate increased under both LIM and MBM in 2009. The increase under LIM was in the neighbourhood of one percentage point, and the change was marginally significant. Under MBM, however, the low income rate doubled between 2007 and 2009, from 2.1% to 4.2% (a significant increase). These changes suggest that the low-income rate among seniors is more sensitive to economic fluctuations than among other groups because, as indicated by Osberg (2001), there are spikes in seniors' income distribution around

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18. The 95% confidence interval estimates in 2007 and 2008 were [0.0874, 0.1037] and [0.0823, 0.0994]. The two intervals overlap considerably.

the low-income threshold such that a small change in their income or the threshold may result in a large change in the incidence. This is also probably the reason why the changes in low-income gap ratio or severity were small under all thresholds.
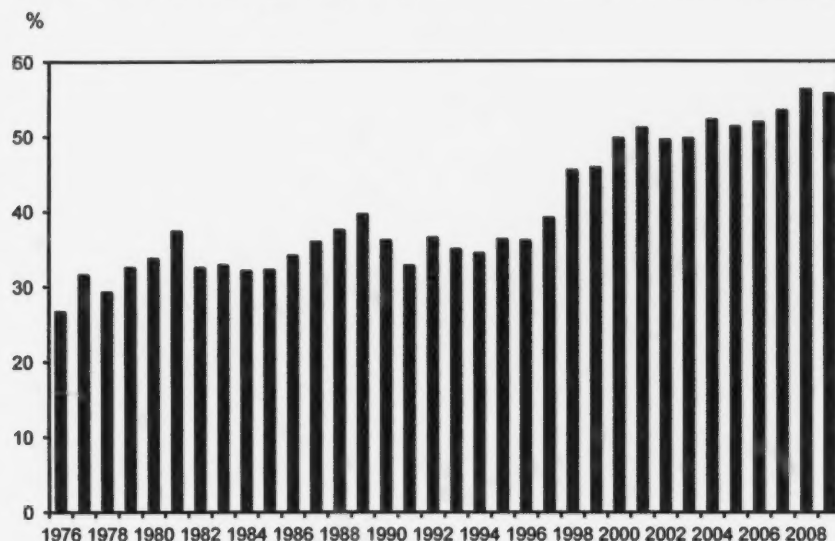
Figure 3.2 Low-income rates among seniors 1976 to 2009
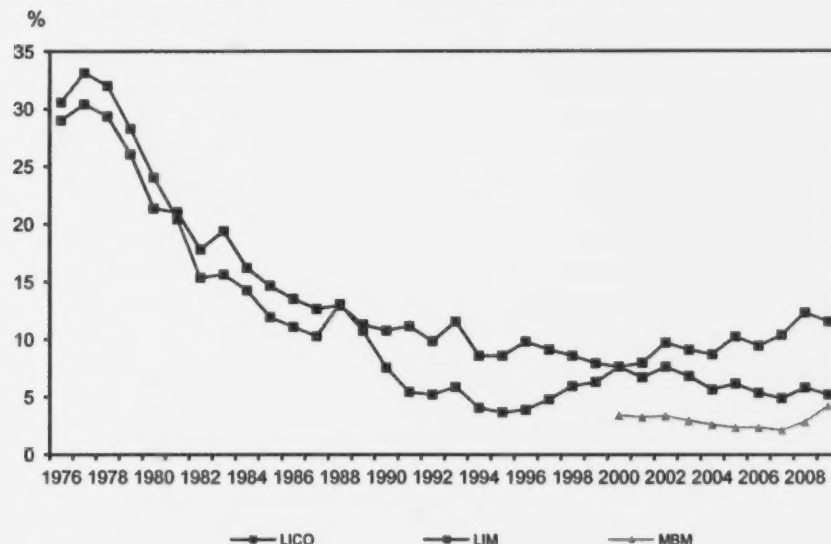
%

Source: Survey of Consumer Finances (1976 to 1995) and Survey of Labour and Income Dynamics (1996 to 2009), Statistics Canada.

Since 1995 the increase in the low-income rate for seniors under LIM indicated that their income did not rise as quickly as the income of non-seniors. As can be seen from the top panel of Figure 3.3, the evolution of income (after-tax and transfers) of seniors and non-seniors from 1976 to 2009 can be divided into three stages. From 1976 to 1989, the income of seniors and non-seniors followed a similar path. From 1990 to 1997, incomes of both groups grew slowly, while the income of seniors grew slightly faster than that of non-seniors. But from 1998, the paths of income for seniors and non-seniors started to diverge, with income of non-seniors growing at an increasingly higher rate than that of seniors.

One possible factor behind the slower growth of seniors' income in the third stage was the slowed growth of government transfers to seniors. The lower panel of Figure 3.3 shows the growth of total government transfers to senior Canadians during the 1976-to-2009 period. Starting from the early 1990s, the median government transfers to seniors increased at a slower rate relative to the period before the early 1990s. Indeed, from 1976 to 1994, the annualized growth rate of median government transfers to seniors was 8.7%, while from 1995 to 2009, the annualized growth rate was 2.0%.

Figure 3.3   Average income by age group (top) and government transfers to seniors (bottom)
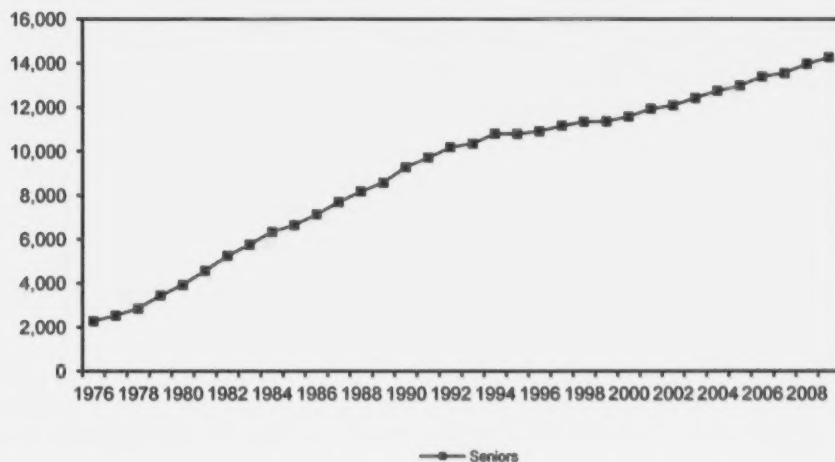
Source: Survey of Consumer Finances (1976 to 1995) and Survey of Labour and Income Dynamics (1996 to 2009), Statistics Canada.

Persons living in lone parent families (lone parents)

Low income among lone parents in Canada has been recently examined by Richards (2010). He characterizes the remarkable decline in the low-income rate for lone parents as a success story. This report adds two insights to his work.[19]

First, we examined higher order low-income statistics, in addition to the low-income rate, for lone parents. As can be seen from the top panel of Figure 3.4, the low-income rates among lone parents fluctuated from 40% to 50% for about 20 years, that is, from 1976 to 1996, according to both the LICO and the LIM lines. Richards (2010) observed that a long-term declining trend in the low-income rate started in 1997 and it declined further to a historically low level in 2007. However, the gap ratio and severity indexes evolved somewhat differently from the low-income rate. The bottom panel of Figure 3.4 suggests that the depth of low income started a long-term declining trend long before 1997, when the low income rate started to decline. We also calculated the severity indexes under different low-income lines for the period from 1976 to 2009 and found the trend to be similar to that of the gap ratio.

Figure 3.4   Low income rates (top) and gap ratios (bottom) for lone parents

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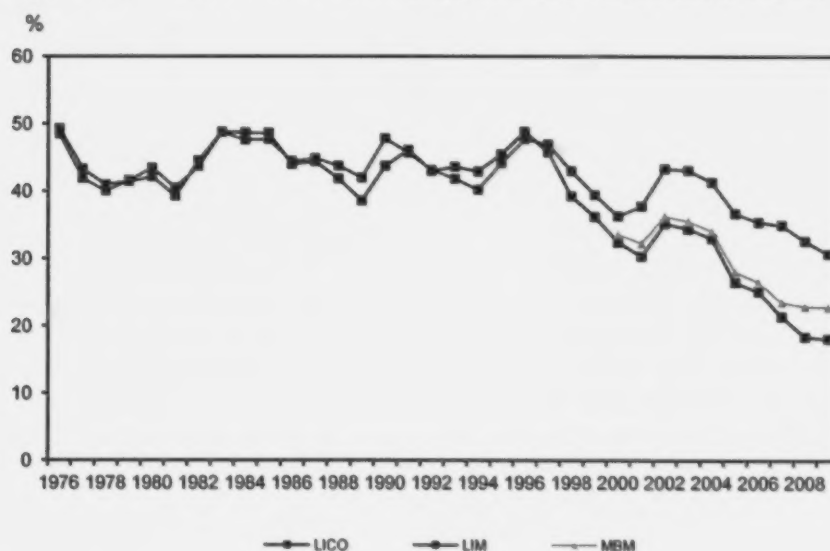
19. We also examined low income for lone parents using the MBM line. The result under this line is essentially the same as that under LICO.

Figure 3.4   Low income rates (top) and gap ratios (bottom) for lone parents (continued)
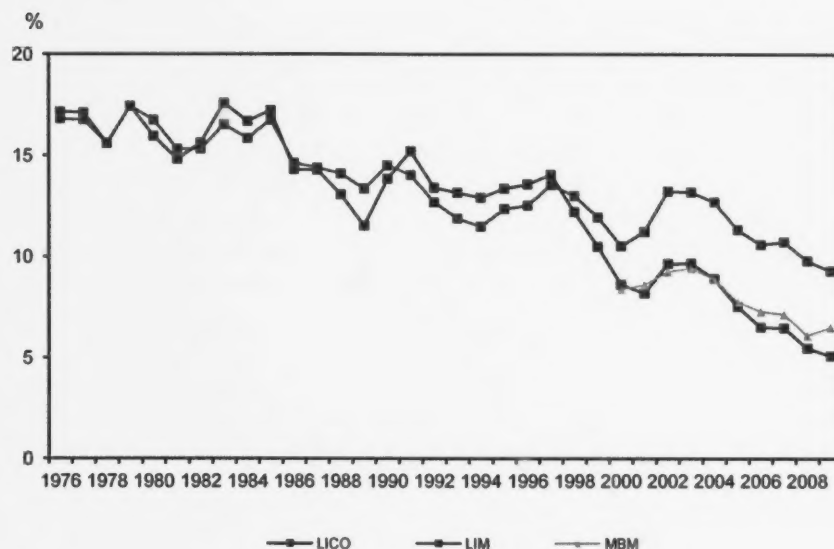
Second, despite the slight increase in low income for the general population from 2007 to 2009, low income for lone parents did not increase in that period. Rather, it continued along a declining trend that started earlier (1997 in the case of the low-income rate and 1986 in the case of the low-income gap ratio and severity) under LICO and LIM (and later, under MBM). Furthermore, the decline in the low-income rate under LICO, the declines in the low-income gap ratio and severity index from 2007 to 2009 were all marginal. As such, the trend in low income among lone parents was different from that of the overall population.

The evolution of low income for lone parents from 1976 to 2009 seemed to coincide with an increasing supply of labour by lone parents. Figure 3.5 shows the percentage of lone parents working 50 weeks or more in this period. Before 1998, the percentage of lone parents working 50 weeks or more varied, but never exceeded 40%. Since then, a strong upward trend emerged and the percentage of lone parents working 50 weeks or more usually exceeded 50%.

Figure 3.5 Percentage of lone parents working 50 to 53 weeks per year

%

Nevertheless, the change in low income for lone parents from 2007 to 2009 leads to an interesting question: is low income among lone parents less sensitive to a recession than that for the population as a whole? One direction for further investigation would be to look at the industries or occupations in which lone parents worked. For example, from 2007 and 2008, the GDP of goods-producing industries declined by close to 4%, while that of the service sector increased 5%. The vast majority of lone parents are women, and given their increased labour force participation one would not expect an increase in the low-income rate for them if they tended to work in industries or occupations less sensitive to a recession.

Unattached non-elderly people

Here we define unattached non-elderly people as those aged 45 to 64 who live alone. Low income incidences for this group of people for the 1976-to-2009 period are contained in Figure 3.6. Low income incidence, as well as the gap ratio and severity for them, were generally high among this group of people. For example, the incidences remained above 30% under LICO, LIM and MBM, even during the 2000-to-2009 period. Likewise, their low income gap ratios and severity indexes (not shown) were also much higher than those for the general population.

There might be several factors behind the high low-income indexes among this group. First, the upper age limit of 64 suggests that they are not at normal retirement age and thus a significant proportion of them were not entitled to retirement pensions and other old age benefits. Second, they may suffer other risks and vulnerabilities. For example, from 2000 to 2009, about a quarter

of the group also had disabilities.[20] Finally, the way low income is measured implies that, other things being equal, low-income statistics for people living alone would be higher than those for people living with others, because they do not enjoy economies of scale in consumption as much as others.

Figure 3.6   Low-income rates for unattached non-elderly people and percentage of those people not working
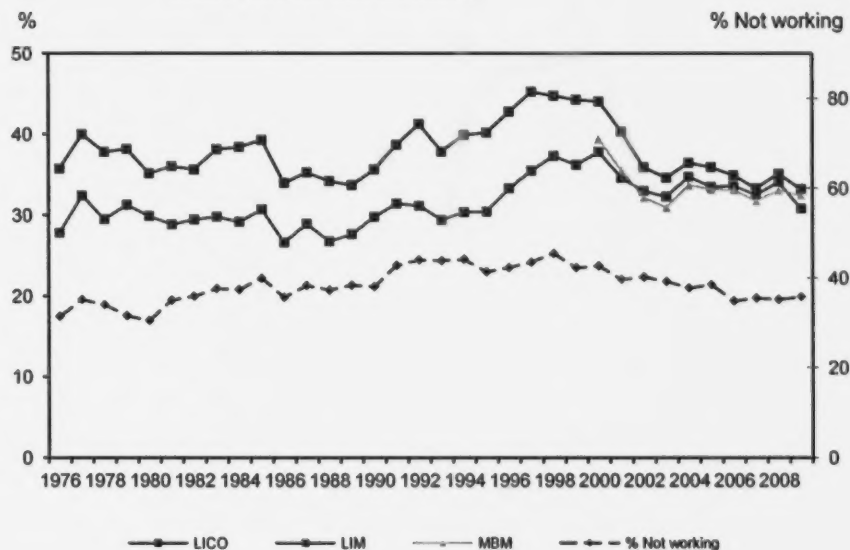
Given relatively low labour force participation rates, it is tempting for one to link government transfers to this group of people with their low-income status. Further investigation shows that labour market activity, rather than government transfers, was strongly correlated with low income for unattached non-elderly people. A particular group characteristic was that a significant portion of them were not working. Figure 3.6 (right axis) indicates that, from 1976 to 1980, about one-third of them did not work. This increased steadily to peak at 45% in 1998. Since then, the percentage of unattached people not working decreased to 35% by the 2007 to 2009 period. This seems to suggest that their low-income rate evolved in concert with the proportion of non-elderly unattached people not working.

In contrast, government transfers evolved differently from their non-transfer incomes. The average and median after-tax income of this group of people increased significantly over time. The only exception was during the 1990s, when little change occurred. On the other hand, government transfers to this group increased rapidly from 1976 to the early 1990s, but stayed at the same level thereafter.[21] From 1976 to 1994, the ratio of average government transfer to

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20. Low income among people with activity limitations was also high. This will be discussed later.
21. There was, however, some difference between men and women within the group. The average transfer for men decreased in this period, while that for women started to increase again in the late 1990s.

average after-tax income for this group increased steadily from 10% to 23% and then declined rapidly to about 14% by 2007 and thereafter.

Comparing the evolutions of income and government transfers with the evolution of low income for the unattached non-elderly people, it can be seen that: (a) despite the increase in income from 1976 to the early 1990s, low income among the group did not decline, and (b) despite stable government transfers after the early 1990s, low income still declined. Hence, the relationship between government transfers and low income for this group was mixed, while the relationship between their labour supply and low income was fairly strong over the long term[22].

Recent immigrants

It is well known that the earnings of recent cohorts of immigrants deteriorated over the past two decades. Moreover, there is also evidence suggesting that the labour market participation rate and the employment rate of new immigrants have deteriorated.[23] Other things being equal, these factors imply that new immigrants would have a higher chance of falling into low income than their counterparts in previous decades.[24] But the evolution of low-income among new immigrants was actually more complex than this. Figure 3.7 presents the low-income rates for new immigrants for the 1976 to 2009 period.[25] The figure shows that the low-income rate among new immigrants was relatively low in the 1970s. It had tripled by the mid 1990s and declined substantially since then. In more recent years, however, the low-income rate for new immigrants started an upward trend.

The deterioration of new immigrants' earning capacity was associated with a greater gap between the earnings of new immigrants and the Canadian-born. This is directly reflected in the low-income statistics for new immigrants. But other factors also played an important role. In particular, the evolution of low income among new immigrants appears to be strongly affected by the total employment of the families of new immigrants. Figure 3.7 contains the average number of weeks worked by family members of new immigrants for the 1976-to-2009 period. It had declined from the 1970s to the lowest level in the mid-1990s. During the 1990s, it varied around 30 weeks per year. As a result, their income stagnated for most of the decade. But starting at the end of 1990s, an upward trend of employment for new immigrants began, matched by declines in the low-income rate and other indicators.

The increase in the low-income rate among new immigrants and the fact that it was higher after the 1990s might also be affected by a less well-known factor: the proportion of students among new immigrants gradually increased over the past 30 years. Before the mid 1990s, about 15% of new immigrants were students. This was similar to the proportion of students among the Canadian-born and older immigrants. But after the mid 1990s, the proportion of students

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22. While a fairly strong relationship exists, between 2008 and 2009 unemployment and the number of EI recipients rose yet the low income incidence fell for the unattached non-elderly.
23 See, for example, Aydemir and Skuterud (2004) and references therein.
24. In this report new immigrants are defined as those who had lived in Canada from 2 to 10 years in the year they were observed.
25. The gap ratio and severity indexes evolved in a similar pattern as the low-income rate for virtually all years except in 2006 and 2007 under MBM. That difference shall be discussed later.

increased to more than 25% among new immigrants, well above the 18% for older immigrants and those born in Canada.[26]

Figure 3.7   Low-income rates among recent immigrants and their weeks worked per year
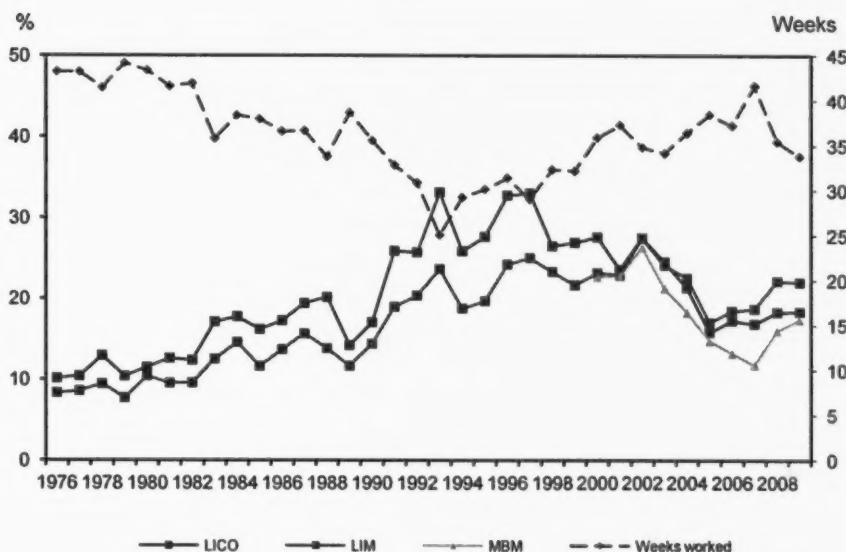
As discussed in the previous chapter, low income among the general population continued a declining trend up to 2007. A similar trend was found among new immigrants when using the MBM.[27] However new immigrants' low-income rate, when measured under LICO and LIM, increased slightly from 2005 to 2007. We also examined the higher order low-income indices and found that changes in the gap ratio and severity indexes under all three lines followed the same declining pattern in low-income rate as that under the MBM. This evidence suggests that low income statistics under LICO and LIM respond differently to those under MBM for new immigrants. As noted in Zhang (2010), new immigrants are most likely to settle in large cities where costs of living are typically high. At the same time we know that the same LICO and LIM threshold apply to all large cities whereas the MBM is different in each city[28].

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26. When students were excluded from new immigrants, low-income rate was generally reduced by 2 to 3 percentage points in recent years.
27. Under MBM, the decline in the low-income rate for the general population from 2005 to 2007 was significant at the 95% confidence level and that for new immigrants was only marginally significant.
28. The MBM in Toronto is 8.8% higher than the MBM in Montreal and 3.5% higher than the MBM in Vancouver. The proportion of immigrants in Toronto and Vancouver is at least twice the level in Montreal however Vancouver has a higher proportion of new immigrants than do Montreal or Toronto.

Figure 3.7 also indicates that the onset of the recession in 2008 affected the low-income rate for new immigrants. As their weeks worked in 2008 dropped abruptly, their low-income rates increased by 3 percentage points under LICO and about 4 percentage points under both LIM and MBM compared with those in 2007. However, only the change under the MBM was marginally significant. The gap ratio and severity indexes under different lines also increased, but these changes were not significant.

Off-reserve Aboriginal people

Low income among Aboriginal people is a concern in Canada. However, the SLID data only allows us to examine low income among off-reserve Aboriginal people for the period from 1996 to 2009. We identify a person as Aboriginal if he or she meets any one of the following three criteria: (1) a person reported he or she is a member of the Aboriginal target group for Employment Equity purposes; (2) a person reported having an Aboriginal background; or (3) a person reported himself or herself as a Treaty Indian or Registered Indian as defined by the *Indian Act of Canada.*

Figure 3.8 contains the trends in the low-income rate and gap ratio for off-reserve Aboriginal people for the period from 1996 to 2009 under LICO, LIM and MBM. Like the low-income rate for lone parents and new immigrants, the low income rate for off-reserve Aboriginal people dropped under all three lines in recent years. The decline in the low-income rate was matched closely by declines of the gap ratio (Figure 3.8, bottom panel) and the severity indexes (not shown). However, the low-income rate under LIM showed a flatter trend since 2000, although this was not accompanied by similar changes in the corresponding gap ratio and severity indexes. Indeed, the higher order low-income statistics under LIM increased briefly from 2000 to 2003 and, as with the other two lines, showed a declining trend from 2004 to 2008. Statistical tests suggest that the gap ratio and severity indexes under the three lines all declined significantly from 2003 to 2008.

As with other groups of people, low income among off-reserve Aboriginal people is strongly tied to their employment patterns. The upper panel of Figure 3.8 indicates the proportion of Aboriginal people (18 to 64 years old) who worked full-year full-time (right axis). From 1996 to 2000, the proportion increased by more than ten percentage points and stayed at about 46% thereafter (up to 2008). The low-income rate mirrored theses changes, but in the opposite direction: low-income rates under LIM and LICO declined about ten percentage points from 1996 to 2000.

Figure 3.8   Low-income rates for off-reserve Aboriginal people and percentage of them working full-year full-time (top) and gap ratios for off-reserve Aboriginal people (bottom)
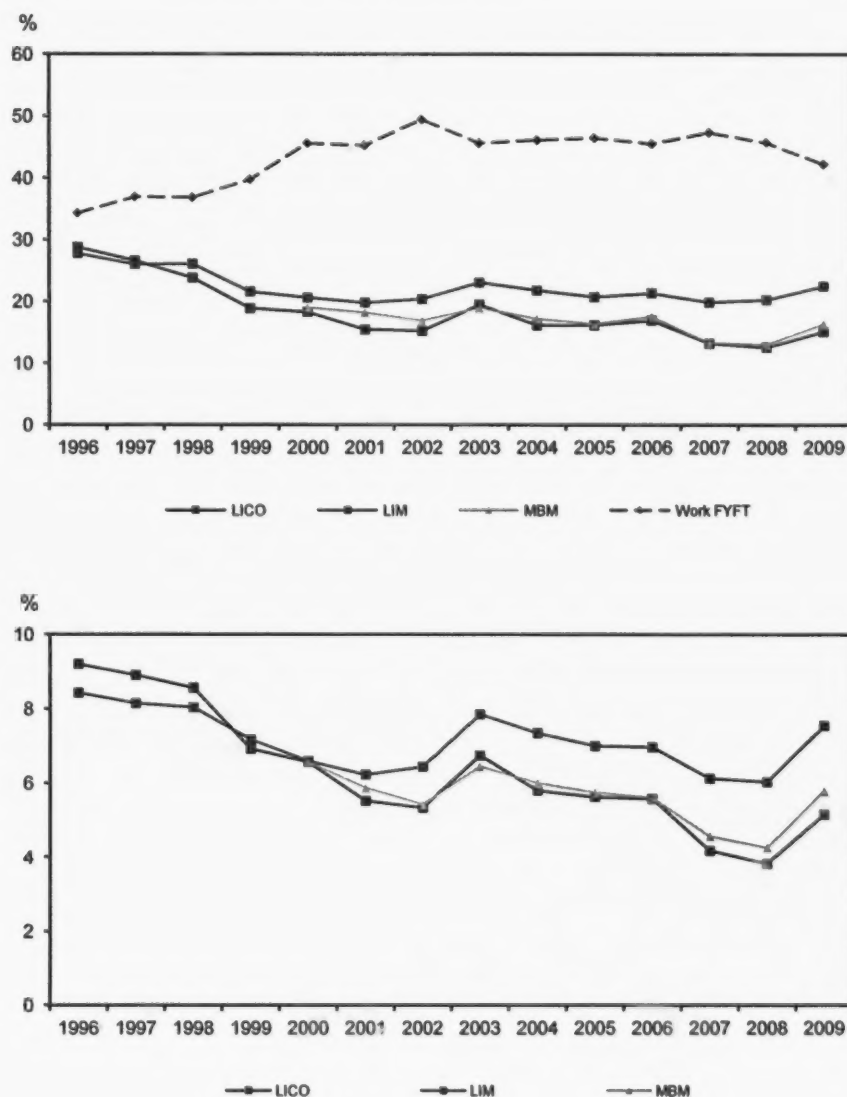
%

(Top chart, y-axis 0 to 60)

Legend: LICO   LIM   MBM   Work FYFT

%

(Bottom chart, y-axis 0 to 10)

Legend: LICO   LIM   MBM

From 2000 to 2008, the proportion of off-reserve Aboriginal people working full-year full-time was very stable (with the exception of 2002, in which the proportion reached a high point of 50%). Likewise, the low-income rate measured by the LIM was also very stable. However, this

stable low-income rate under LIM was accompanied by a declining trend in the gap ratio and severity indexes. This was probably related to the fact that, during that period, the proportion of part-time workers among this group increased by several percentage points, which, while not necessarily reducing the incidence of low income, would help to reduce the gap ratio and severity index.

However, the recent recession seems to have affected off-reserve Aboriginal people. From 2008 to 2009, the percentage of this group of people (aged 18 to 64) working full-year full-time dropped by almost four percentage points to about 42%, the lowest level since 2000. This was immediately reflected in the increases of low income incidence and gap ratio for off-reserve Aboriginal people under all three low income lines.

People with activity limitations

The classification of people with activity limitations went through some revisions in the late 1990s. We focused on years since 1999, in which a person is identified as having activity limitations if he or she reported having difficulty with daily living activities or if the person reported a physical or mental condition or health problem that reduced the amount or kind of activities that he or she could do at home, school or work.

We would like to point out that low income statistics under the current practices in Canada may well under-estimate the hardship experienced by people with activity limitations. For any person dealing with health issues, it is reasonable to assume that the cost of living would be higher than for an otherwise identical person. But none of the three low-income lines takes this into consideration. Indeed, low-income statistics for people with activity limitations are calculated in the same way as those for anyone else, and the statistics below are no exception. Nevertheless, we are paying particular attention to trends in low income rather than the level of the statistics.

Figure 3.9 presents low-income rates and gap ratio indexes for people with activity limitations.[29] Low income under different lines appeared to have moved in different directions in the last decade: the low-income rate, gap ratio and severity indexes under LIM increased over time, while those under LICO and MBM decreased. For example, from 1999 to 2009, the low-income rate under LIM increased from 17% to 20%, while it decreased from 18% to 14% under LICO. But under MBM, there was little change from 2000 to 2009.

In 2004, even though low-income rates did not change much relative to the previous year under all lines, there were one-time abrupt increases in the gap ratio and severity indexes. For example, under both MBM and LIM, the gap ratios increased by about half a percentage point, and some of these changes were statistically significant. This probably reflects a much slower growth in income of people with activity limitations relative to the change in income for the whole population—our data shows that, from 2003 to 2004, the median income for the general population increased by about 3%, while the median income for people with activity limitations stayed constant.

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29. The trend in the severity index is similar to that in the gap ratio.

Figure 3.9   Low income rates (top) and gap ratios (bottom) for people with activity limitations, 1999 to 2009
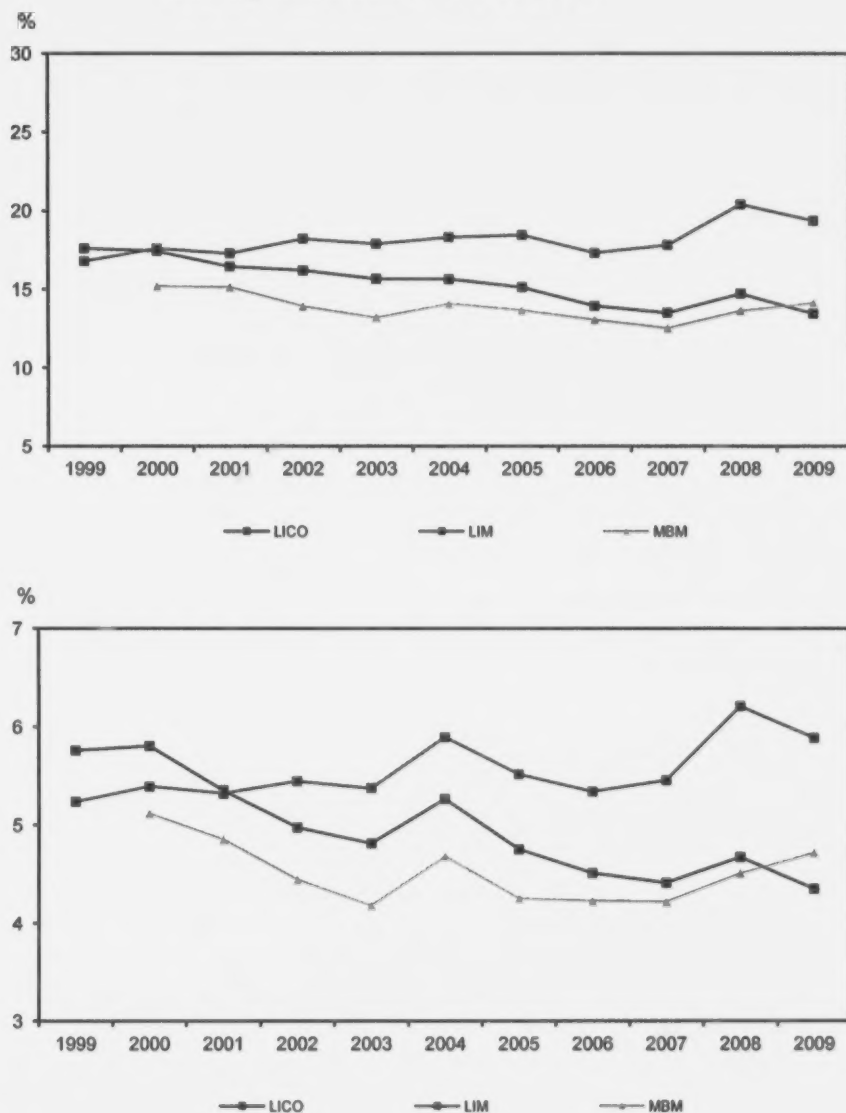
Like low income for the general population, low income for activity-limited people increased in 2008 relative to those in 2007. The increase was strong under LIM, measured by the significant increases in the low-income rate and gap ratio. Interestingly, from 2008 to 2009, low income statistics did not change much for people with activity limitations.

Summary

In this chapter, we examined low income among groups of people who are often referred to as groups at risk of social exclusion. The result shows that, in the last few decades, low income measures improved the most for senior Canadians. Lone parents also experienced remarkable progress, but low income among them was still high relative to other groups. However, the situation among unattached non-elderly people was probably the most serious among all groups, even though there were improvements over the last ten years for them.

Furthermore, although the Canadian economy experienced almost uninterrupted growth over the last decade and many vulnerable groups benefited from that with significant declines in low income, not all of them benefited equally from the growth. For example, low income among senior Canadians and Canadians with activity limitations increased recently, at least under the relative measures.

Finally, low income among off-reserve Aboriginal people, children, recent immigrants or even people with activity limitations was about half as those among unattached non-elderly people or lone parents. There still may be pockets of people falling behind in other dimensions. In the next chapter, we shall focus on the regional dimension.

Chapter 4 Low income across provinces and cities

In this chapter, we discuss the evolution of low income at sub-national levels and compare low income between provinces and cities. We also attempt to identify pockets of low-income people across provinces and cities, so as to provide context for place-based policy discussions. While the SLID sample allows us to examine low income for groups of individuals in practically all provinces, it does not allow us to do this across all cities. We focus on cities with a population of 1 million or more in 2009: Montréal, Ottawa–Gatineau, Toronto, Calgary, Edmonton and Vancouver, as well as Winnipeg.[30]

We examined the period from 1976 to 2009. More attention was paid to the 2000-to-2009 period, in which all three low-income lines were available and the definitions for several groups of individuals were consistent. Thus, when low income across groups of individuals within a province or city is discussed, the reference period is limited to 2000 to 2009. Low income rates in 2000 and 2009 for the provinces, selected cities and across various groups of individuals can be found from Tables 4.1 and 4.2 at the end of this chapter. [31]

The evolution of low income in provinces and cities

The provinces

In Newfoundland and Labrador the incidence of low income dropped significantly, with particular strong declines from 1976 to 1989 and from 2000 to 2008. The decline from 1976 to 1989 resulted in the provincial incidence of low income approaching the national average. Similarly, from 2000 to 2009, low-income rates measured by all three lines declined. In 2000, the provincial low-income rates were 13.2% under the low income cut-off (LICO), 21.4% under the low-income measure (LIM) and 20.5% under the market basket measure (MBM), and under both LIM and MBM, the provincial incidences were significantly higher than the corresponding national incidences in 2000.[32] But in more recent years, the low-income rate under LICO was lower than the national rate, the differences between provincial and national rates under LIM and MBM were much smaller than in the early 2000s, and these declines in provincial low-income rates were accompanied by similar changes in the low-income gap ratios. However, under LIM and MBM, incidences of low income in this province were still significantly higher than the corresponding national level as of 2009.

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30. Winnipeg had slightly more than 742,000 residents in 2009. It was selected because the number of people sampled from that city in Survey of Labour and Income Dynamics 2009 was fairly large (2,464 observations).
31 Tables A4 and A5 in the Appendix contain the 95% confidence intervals for Tables 4.1 and 4.2 respectively.
32. Because the provincial and the national samples are not independent, the comparison was actually made between the provincial sample and the sample consisting of those from the other nine provinces. In what follows, whenever we make a test between a region and the nation, or a group from a region with a group at the national level, the national sample represents those from all other regions, with the region in question being excluded,so that the two samples are not overlapping.

Prince Edward Island also saw improvement. Its distinguishing characteristic was a persistent long-term decline in the incidence of low income under all three thresholds. Under LICO, the provincial incidence of low income was similar to the national incidence in the mid-1970s. Starting in the early 1980s, the incidence at the provincial level was consistently below the national level, and the differences were statistically significant in almost every year. The provincial incidence of low income under LIM was above the national level before the 1990s, but thereafter, the incidence at the provincial level was not statistically different from the national level.[33] Likewise, under MBM, the incidence at the provincial level was higher than that at the national level in the early 2000s, but more recently the incidence at the provincial level matched that at the national level.

Nova Scotia followed the national trend for low income at the provincial level under all thresholds. Under LICO, the incidence at the provincial level was tied to that at the national level. But under LIM (from 1978 to 2009) and MBM (from 2000 and 2009), low-income rates in Nova Scotia were significantly higher than the national averages. A somewhat discouraging sign for this province was that, from 2006 to 2009, the gaps between the provincial and national incidences of low income under LIM and MBM became wider than they were before 2006.

New Brunswick had, in the mid-1980s, a higher incidence of low income under LICO than the national level. Differences between the incidence at the provincial and national level were almost always statistically significant. However, starting in the late 1990s the incidence of low income under LICO dropped below the national level, and continuing improvements were observed during the most recent years. As in Nova Scotia, the incidences under LIM and MBM in New Brunswick were higher than the corresponding incidences at the national level. But an encouraging sign was that low income improved under both LICO and MBM from 2000 to 2009, and there were also continuing improvements in the four years up to 2009 under LIM. Indeed, by 2009, the provincial low income rates under LIM and MBM were no longer significantly different from the corresponding national rates.

Quebec generally followed the national trend in low income from the early 1980's to the late 1990's. During this time the provincial low-income rates under LICO and LIM were generally higher than the corresponding national rate. But from the late 1990s to the early 2000s the incidence dropped significantly and dropped faster than that at the national level under LICO, such that by the late 2000s, the national and provincial incidences were no longer different from each other. Under LIM, the provincial low-income rate had also been higher than the national rate before the early 2000s. But thereafter, the provincial rate declined and started to approach the national rate. The early 2000s also witnessed significant declines in the incidence of low income under MBM for Quebec. But that trend reversed by 2005 when the incidences of low income started to inch up to the national level.

Ontario's low income rates, like Quebec's, rose around recessions and fell between them. But different from Quebec, the low income situation in Ontario deteriorated over time, particularly under LICO and LIM. In 1976 the Ontario low income rates were just over 80% of the national

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33. Although from 1999 to 2002, the provincial level was above the national level.

rates and they dropped to a low point of about 75% of national rates by the mid-1980's. Afterward the incidence of low income at the provincial level rose fairly steadily to approach the national level. By 2009 the incidence in Ontario under the LICO exceeded that of Canada for the first time (10.1% vs. 9.6%). The year 2004 was a watermark for low income under MBM: from 2000 to 2003, the provincial incidence was below the national incidence, while from 2004, the provincial incidence rose to the national level. In addition, Ontario was different from all its eastward provincial neighbors in that its low-income incidences and gap ratios rose significantly from 2007 to 2009, under both LIM and MBM.

Manitoba has seen improvement since 1976, when the incidence of low income was about 30% higher than those at the national level under LICO and LIM. Manitoba gained ground and was roughly equal to the national level in 1983-1984 but then rose to about 20% above the National level in the late 1980's and early 1990's. By the mid-late 1990s, the incidence of low income under LICO for Manitoba was similar to the national level. The incidence under LIM at the provincial level was higher than that at the national level, and often significantly. Both the incidence of low income and the gap ratio have stayed relatively flat since the early 1980s in Manitoba, and with the national incidence following an upward trend since the late 1980s, the provincial and national difference became smaller in more recent years.[34] More remarkably, the low-income gap ratio and the severity index dropped in Manitoba between 2000 and 2009 under all three lines. Another positive sign was that the provincial incidence under MBM was consistently below the national level, sometimes significantly.

The low income rate under LICO passed a watershed in Saskatchewan in the mid-1990s. Before that, the incidences of low income at the provincial and national level were similar; afterwards the provincial-level incidence dropped below the national, and the difference was often statistically significant. The incidences under LIM and MBM for the province were consistently higher than the corresponding national ones, and the differences under LIM were particularly large and significant before 2009. But encouragingly, for all lines in years leading up to 2008, when the incidence at the national level dropped, the incidence at the provincial level dropped faster, and when the incidence at the national level increased or stayed flat, the incidence at the provincial level continued to decline. Hence, it is not surprising to observe that by 2009, the provincial low-income rates under both LIM and MBM dropped to a historical low, dropping below the national level for the first time.

Alberta saw incidences of low income consistently below the national level under all three thresholds, except during the decade from the mid-1980s to the mid-1990s. A strong downward trend in the incidence started in the early 1990s, leading to significantly lower incidences under all three thresholds for Alberta, compared to the national level, from 2003 to 2008. However, the province was hit hard by the recent recession. In 2009, low-income incidences, gap ratios and the severity indexes under all three lines became significantly higher than those in 2008, and the increase was particularly strong under MBM with the incidence rising four percentage points to 10% between 2008 and 2009.

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34. Although in 2009, the provincial incidence under LIM increased and became significantly higher than the national level while under the LICO the incidence dropped to 93% of the national level in 2008 and remained there in 2009.

British Columbia generally followed the national low-income trend. However, when low income increased at the national level, the provincial low income increased faster and when the national low income decreased, the provincial low income decreased faster. From 1976 to 1983 the incidence of low income was lower in BC than in Canada. From there until 1998 the rates were quite similar under both LICO and LIM. However, from the late 1990s onward, the provincial incidence started to surpass the national level under the two lines, and the difference was often statistically significant. As well, under MBM, low-income incidence in this province had always been above the national level.

The cities

Montreal's incidence of low income stayed relatively flat from 1976 to the early 1990s under both LICO and LIM, while during the rest of the 1990s, it increased. But over the next ten years, Montréal residents enjoyed significant reductions in the incidence of low income. Nevertheless, low-income incidence in Montréal was still one of the highest among large cities in recent years, and in the last two years, there was evidence to suggest that low income in Montreal increased again. For example, under MBM, the low-income incidence in 2008-2009 was significantly higher than in the 2004-to-2007 period. The incidence under LIM also increased, and the increase in 2008 was particularly strong.[35]

Ottawa–Gatineau saw highs and lows in the incidence of low income in the 1976-to-2009 period. As in Montréal, Ottawa–Gatineau's incidence of low income reached a historic peak in 1996 and 1997. Over the following ten years, residents of the national capital region experienced declining incidences of low income. But in 2008, low-income incidences under all three lines increased compared to the previous year. The gap ratio under LIM also rose significantly. However, the overall declining trend had not been altered as low income dropped again in 2009 relative to that in 2008 (although not significantly).

Toronto experienced some significant reductions in low income under both LICO and LIM during the late 1980s. But as in other large cities, the low-income incidence under LICO varied dramatically in Toronto, ranging from less than 8% in 1988 to more than 17% in 1995. During the last ten years, from 2000 to 2009, while the low-income incidence under LICO and MBM fluctuated between 10% and 13%, the incidence under LIM followed a strong upward trend, increasing from about 9% to 13%, and a similar trend was observed in the low-income gap ratio and the severity index under LIM.[36]

Winnipeg residents had a low-income rate in 2008 similar to that in 1976 under LIM. As well, no clear trend in the LICO rate can be seen before the 1990s. But from the mid 1990s to 2009, the low-income rate under the LICO declined significantly. Furthermore, the low-income gap ratio and severity index declined under all three lines during the 2000-to-2009 period, although only the drops in the LICO gap ratio and severity index were significant.

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35. There was a decline in low-income incidence in 2009 under LICO, but this was not supported by the corresponding drops in the gap and severity indexes.
36. The upward trend in the gap ratio and severity indices had started in the late 1990s.

Calgary's incidence of low income under both LICO and LIM increased steadily from 1976 to the early 1990s. Thereafter, the incidence dropped back to the mid-1970s level. However, the reduction in low income from the early 1990s to 2008 was dramatic. For example, at the peak around 1992, the LICO and LIM incidences in Calgary were practically the highest among all major cities. By 2000, low-income rates for this city fell to the lowest among all large cities: 10.0% under LICO; 7.0%, LIM; and 8.9%, MBM. By 2008, they were still the lowest: 6.6% under LICO; 5.1%, LIM; and 6.0%, MBM. However, the latest recession led the LIM gap ratio to double over the level in 2007.

Edmonton, like Calgary, saw rising low-income rates from 1976 to the early 1990s and dramatically falling rates thereafter. In contrast to Calgary, low-income rates under LICO and LIM in this city fell somewhat below their mid-1970s levels. Reductions in low income from the early 1990s to 2008 were also strong in Edmonton. In 2000, the incidences were 13.7% under the LICO, 10.1% under the LIM; and 10.1% under the MBM. By 2008, these dropped significantly to 7.0% under the LICO; 7.1% under the LIM, and 4.9% under the MBM. But the latest recession struck Edmonton hard.[37] The incidence, gap ratio and severity indexes under all three lines increased in 2009 relative to the 2006-2008 level. For example, the incidence under MBM was about 5% in the three years leading to 2009. It reached 12% in 2009.

Vancouver's low-income situation was mixed. From 1976 to the early 1990s, low-income rates under both LICO and LIM increased much of the time. The city's incidence of low income under LICO declined from the late 1990s to 2007. This was accompanied by the declining incidence under MBM from 2000 to 2007. But the incidence of low income under LIM followed a strong upward trend starting from the late 1980s. However, the gap ratio and severity indices dropped uniformly under all three lines in the period from 2000-to-2007. The latest recession also struck Vancouver, resulting in greater low-income incidence, gap ratio and severity in 2009 than in 2007 under all three thresholds.

Comparisons of low income among provinces and cities

A discussion of strategy and rules of comparison

Robust comparisons of low income between provinces or cities are not straightforward, nor are they free of controversy. Our approach is to rely on multiple low income lines and multiple indexes. We also take into account the evolution of low income for a province or a city.

Using multiple lines is desirable because low income can be measured from different angles. A region might have done very well under a relative line, but under an absolute line, a different picture may appear. Hence a comparison with a single line is not as robust as that with multiple lines. Employing multiple indexes is desirable because different indexes have different properties and they provide different information. A comparison using a single index can be

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37. Only Vancouver had a similar situation as in Edmonton.

misleading. For example, a region may have high incidence, while its gap ratio might be quite low, or vice versa.

It is also desirable to compare low-income at different points of time. A comparison at any particular point in time may not be robust because regional economies may evolve along different paths. In a particular year, some regions might be already out of a recession while others might still be in a trough. Of course, it was not practical to make comparisons at every point of time. We report on our low-income ranking for 2009, but the result is not based on the 2009 low-income statistics only. The evolution of low income from 1976 to 2009 (from 2000 to 2009 under MBM) in a province or city is also taken into consideration.

We employed five rules to help us compare low income between provinces and cities. First, we based all comparisons on rigorous statistical tests. Low-income indices themselves are estimates from survey samples, and are thus affected by sampling variations. Two provinces or cities can only be meaningfully compared if differences in their low-income indices are statistically significant.[38] In particular, if the estimated confidence interval of a low-income index for one province overlapped that of another province, then the two provinces were inferred to have the same level of low income. If the two intervals did not overlap, or if they overlapped only slightly, we would say that the two provinces were significantly or marginally different from each other, respectively.

Second, while we focus on low-income incidence estimates for the comparisons, the gap ratio and the severity index are also employed as complementary factors. The gap ratio is a higher-order index than the incidence; the severity index is a higher order index than the gap ratio. Hence, if two provinces or cities had the same incidence, but one had a higher gap ratio, then the one with higher gap ratio is ranked below the other. Similarly, when both the incidences and the gap ratios are the same, low-income severity is employed in the comparison.

Third, when different thresholds gave different results in low-income comparisons, we put lower weight to results under the LICO than to those under MBM and LIM. In the literature, low-income lines such as the LIM are typically viewed as thresholds to help identify individuals who do not have the resources to fully participate in community life. In this sense, a person with income below the LIM threshold is likely to be at high risk of social exclusion. Since the LIM thresholds are rebased every year, they would reflect the contemporary standard of living. On the contrary, the current LICO thresholds are based on Canadian households' 1992 standard of living. Although they have been updated according to changes in the consumer price index every year, their real values remain at the 1992 level.[39]

Fourth, when the rules described above could not help us make a comparison, we examined how low income had evolved within a province or city. If two regions were the same according to the rules above, we would use the relative position of a province or city to determine its rank. For example, if two provinces had the same incidence of low income, gap ratio and severity in

38. All of the comparisons to follow are based on comparing the 95% confidence intervals on the corresponding low income indices. This practice has been followed by Osberg and Xu (1999), among others.
39. In terms of the ability to reflect the changing standard of living, the MBM threshold falls between the thresholds of LICO and LIM because it is rebased periodically.

2009, but one had higher incidence in 1976 or 2000 than the other, it would be reasonable to say that the province with the higher incidence in 1976 was ahead of the other province because it progressed more in reducing low income over time. Finally, we conducted stochastic dominance tests of various orders to rank the provinces if the first four rules failed to identify the position of a province or city.

Of course, the above rules are not without caveats. On the one hand, even though they are reasonable to us, they will still be debatable to some readers. On the other hand, there is no guarantee that the comparisons are complete. For example, if the estimated confidence interval of a low income index for one province is so wide that all the intervals for other provinces fall between the upper and lower bounds of the estimated interval for the province in question, then the province cannot be ranked. In addition, all three low-income lines are based on certain assumptions and expert judgments. Our results will be subject to bias because of these assumptions and judgments. Nevertheless, we believe that the multiple-period, multiple-line, multiple-index approach is an important improvement over a single-point, single-line, single-index approach in low income comparisons. Our hope is that the simple, transparent rules we have created can provide a basis for further discussions.

Low-income comparisons between provinces

Prince Edward Island fared best among all of the ten provinces. In terms of low-income incidence, the province of Alberta was ahead of PEI under LIM in 2009. But under LICO, PEI was ahead of Alberta, while under MBM, the incidences of the two provinces were tied. However, when the gap ratios were examined, PEI was the best among all ten provinces under all three lines, and the severity indexes in PEI were practically the lowest over all other provinces in 2009. In addition, the evolution of low income in PEI was positive. It advanced from the middle of the country's low-income ladder in 1976 to the top by 2009.

The province of Alberta followed PEI closely. Indeed, if we were to use low-income incidence alone with a stronger emphasis on the LIM and MBM lines, Alberta would have been ranked ahead of PEI.[40] But the low-income gap ratios and the severity indexes in Alberta were much higher than those of PEI. Indeed, the gap ratios and the severity indexes in Alberta were even higher than those in several other provinces, such as Saskatchewan, Manitoba and Newfoundland and Labrador. In addition, Alberta was in a relatively better position in 1976 in the low-income ladder and hence its long-term progress was not as strong as that of PEI.

Saskatchewan followed Alberta. In 2009, under LIM, the incidence in Saskatchewan was only higher than that of Alberta, basically the same as those in PEI and Ontario, and lower than those of the other six provinces. Under MBM, its incidence was similar to the two front-runners (PEI and Alberta), while under LICO, Saskatchewan's incidence was only higher than that of PEI. In addition, this province had made strong progress in low income over time. In 1976, it was ranked in the upper middle, while by 2009 it became one of the top three provinces according to the low-income incidence. We noticed that Saskatchewan's low-income gap ratio

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40. As noted before, the latest recession had a large effect in Alberta's low income in 2009. If we were to rank the provinces according to low income in 2008, Alberta would have been ahead of PEI.

was similar to that of Manitoba and Newfoundland and Labrador, while its low income severity was higher than both provinces in 2009. But when stochastic dominance tests were conducted, Saskatchewan dominated Manitoba, Newfoundland and Labrador and Ontario in second order tests.[41]

The above comparison leaves Manitoba, Ontario and Newfoundland and Labrador to compete for the next spot. In terms of low-income incidence, the evidence was mixed. Ontario ranked higher than Manitoba and was similar to Newfoundland and Labrador under LIM. Under MBM, Manitoba ranked ahead of Newfoundland and Labrador and was similar to Ontario. But under LICO, Ontario's incidence was higher than that of Newfoundland and Labrador and the same as Manitoba. The gap ratio and severity indexes showed similar mixing patterns between these provinces. However, when we put more weight on incidences based on LIM and MBM than on those based on LICO, Ontario was ranked ahead of the other two provinces.

Newfoundland and Manitoba made more progress in low-income reduction over time than did Ontario from 1976 to 2009, but results from dominance tests suggest that Ontario dominated Newfoundland and Labrador in second order for a threshold up to $13,977 in 2009. Ontario also dominated Manitoba in second order for a threshold up to $18,846, while Manitoba dominated Newfoundland and Labrador in second order for a threshold between $1,002 and $12,245. Hence, we would rank Manitoba after Ontario and Newfoundland and Labrador after Manitoba in 2009.

Quebec and New Brunswick seemed to be in line for the next spot. It is hard to distinguish them in terms of their low-income incidence in 2009. Under LIM, the two provinces were similar. But under MBM, the incidence in Quebec was marginally higher than that in New Brunswick, while under LICO, the incidence in New Brunswick was significantly lower than that in Quebec. On the other hand, under MBM and LIM, the gap ratio and the severity indexes in Quebec were marginally lower than those in New Brunswick. However, New Brunswick made more progress over time than Quebec did under LIM and MBM. Those uncertainties were made a bit clear with dominance tests since we found that Quebec dominated New Brunswick in second order tests for any give threshold. Hence, we would rank Quebec ahead of New Brunswick.

The two remaining provinces, Nova Scotia and British Columbia, had similar incidence, gap ratio and severity index estimates under both LIM and MBM in 2009, but under LICO, the indexes in Nova Scotia were significantly lower than those in BC. In addition, under both LICO and LIM, Nova Scotia made more progress in low-income reduction in the period from 1976 to 2009, although under MBM and LIM, BC progressed more than Nova Scotia from 2000 to 2009. The overall evidence suggests that Nova Scotia was slightly ahead of British Columbia.

Low-Income comparisons between major cities

Calgary and Ottawa-Gatineau shared top spot in having the least low-income among the major cities in 2009. Under LIM, the low-income incidence for Edmonton was not significantly different

41. Saskatchewan dominated Manitoba, Newfoundland and Labrador, and Ontario at the second order, when the threshold was set between 0 and $18,785, between 0 and $15,750 and between $8088 and $18,692, respectively.

from those of Calgary and Ottawa-Gatineau. Under the MBM, Winnipeg was also a potential candidate, while under the LICO, Winnipeg and Edmonton were the competitors. But since Edmonton had marginally higher incidence than Calgary and Winnipeg, and significantly higher gap ratio and severity than Winnipeg, we excluded Edmonton from the candidates for the top spot.

In 2009 Winnipeg had marginally lower gap ratio and severity than Calgary under MBM and its historical progress was impressive under both LICO and MBM. But its incidence under LIM was significantly higher than that in Calgary. Results from dominance tests also show that Calgary and Ottawa-Gatineau dominated Winnipeg[42]. This leaves Calgary and Ottawa-Gatineau for the comparison. In terms of the three low-income lines and indexes, the two cities were not statistically different from each other. But Ottawa-Gatineau made stronger progress than Calgary from 1976 to 2009, while results from stochastic dominance tests suggest that Calgary dominated Ottawa-Gatineau. Hence, we failed to distinguish the two cities.

Between Edmonton and Winnipeg, Winnipeg was ahead of Edmonton. Under both LICO and LIM, these two cities were not different in low-income incidences, gap ratios and the severity indexes in 2009. But under MBM, the incidence and the severity index in Winnipeg were marginally lower than those in Edmonton, and the gap ratio of the former was significantly lower than in the latter, largely due to a significant increase in low income in Edmonton in 2009. In addition, low-income incidence under LICO dropped strongly between 1976 and 2009 in Winnipeg, from 19% to 10%, suggesting Winnipeg enjoyed a strong historical progress in low income reduction.

Among the rest of the three cities, Vancouver had a clear disadvantage in low-income comparisons under all lines and all indexes. It is thus a matter of ranking the other two cities: Montreal and Toronto. In 2009, these two cities had no significant differences under the three low income lines and indexes. However, low income had been stronger in Montreal than in Toronto historically. For example, low-income incidence in Montreal in 1976 was about 18%. By 2009, it dropped to about 13%. But results from dominance tests suggest that Toronto dominated Montreal in second order for a threshold up to $14,469. As a result, we put Montreal and Toronto in the same position on the low-income ladder.

The disadvantaged position of Vancouver's low income can be clearly observed under all three low income lines and indexes. Under MBM and LICO, the incidences, gap ratios and severity indexes in Vancouver were significantly higher than those in other cities. While under LIM, Vancouver's low-income incidence was significantly higher than those in five other cities, only Montreal had a similar incidence. But the gap ratio in Vancouver was higher than all cities, including Montreal. Hence, we put Vancouver last among the seven major cities.

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42. Calgary dominated Winnipeg in first order tests for a threshold between $2,745 and $13,821, while Ottawa-Gatineau dominated Winnipeg in second order tests for a threshold up to $17,742.

Low-income groups across provinces and cities

Low income groups across provinces

Newfoundland and Labrador saw significant declines in low-income rates for children, people with activity limitations and to a less extent, lone parents, from 2000 to 2009, under all three low-income lines. But compared to the national level, the province still had pockets of individuals facing economic hardship in 2009. For example, under both LIM and MBM, low-income rates for lone parents and children were much higher than the national average, while under MBM, unattached non-elderly individuals had a much higher incidence than the corresponding national average.

Prince Edward Island saw little gain in the reduction of low-income incidence from 2000 to 2009 among children, seniors, lone parents, unattached non-elderly people and people with activity limitations.[43] Under all three lines, the 95% confidence interval estimates of low-income rates in 2009 were not statistically different from those in 2000 for these groups of individuals. In addition, low-income rates for lone parents were still significantly higher than the national averages under both LIM and MBM in 2009. Hence, the observed improvement in low income in this province did not benefit any of these groups of individuals.

Nova Scotia also had small reductions in low-income across several vulnerable groups from 2000 to 2009. At the same time, low-income rates under LIM and MBM for seniors, lone parents and off-reserve Aboriginal persons in 2009 were all significantly higher than the corresponding national averages.

New Brunswick's changes in low-income rates between 2000 and 2009 for the vulnerable groups (children, seniors, lone parents, unattached non-elderly persons and people with activity limitations) were not statistically significant under any threshold. When compared to national averages, however, we observe that lone parents living in this province still had much higher incidence under both LIM and MBM (40 and 36%, respectively) in 2009.

Quebec made significant progress in low income reduction for children and lone parents between 2000 and 2009. In 2000, the low-income rate for children was 16.1% under LICO; 17.9% under LIM; and 13.7% under MBM. Nine years later, this dropped to 7.7% under LICO; 12.8% under LIM; and 8.9% under MBM. While in 2000, low-income rates for lone parents were 37.9% under LICO; 40.3% under LIM; and 36.0% under MBM. By 2009, they dropped to 18.2% under LICO; 28.4% under LIM; and 21.0% under MBM, respectively. Low income among seniors in Quebec was still higher than the national average in 2009 under both LICO and LIM.

Ontario saw an important improvement for lone parents in low income from 2000 to 2009. Under both LICO and MBM, low-income rates for lone parents dropped significantly. In 2000, they were 29.0% (under LICO) and 28.3% (under MBM). By 2009, these dropped to 18.2% and

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43. The numbers of observations for other groups such as recent immigrants or off-reserve Aboriginal people were not large enough to make meaningful inference on their low income situation.

20.5%, respectively. But low-income rates for people with activity limitations increased under LIM and MBM, while remained largely the same under LICO. For this group of people, the low-income rate increased by seven percentage points under LIM, from 13.1% to 20.1% between 2000 and 2009, while under MBM, it increased nearly five percentage points, from 11.2% to 14.7%. However, in Ontario, none of the vulnerable groups we examined had significantly higher incidence than their counterparts in other parts of the country in 2009.

Manitoba showed progress in reductions in the low income of lone parents during the 2000-to-2009 period. Under both LICO and MBM, low-income rates for lone parents from this province dropped. In 2000, their low-income rates were 42.2% and 40.7% under LICO and MBM. In 2009, these declined to 21.9% and 24.2%, respectively. However, if a relative LIM is employed, the low-income rate for this group of individuals did not change much between 2000 and 2009 and in 2009, their low-income rate was still significantly higher than the national average.

Saskatchewan's overall improvement in low income reduction between 2000 and 2009 did not equally benefit the various vulnerable groups. Only children saw some progress. In 2000, low-income rates for children were 16.9% and 21.5% under LICO and LIM. These dropped to 9.1% and 15.2%, respectively by 2009. There was also decline in the incidence for unattached non-elderly individuals under LICO, but this was not observed under the other two thresholds. Nevertheless, people with activity limitations did well when compared with their counterparts from the rest of the country in 2009 under all three low-income lines, while in contrast, lone parents from this province had significantly higher incidence when compared with lone parents from the rest of the country under any threshold in 2009.

Alberta's improvements in its low-income rates occurred for all groups of at-risk people by practically each measurement from 2000 to 2008. But the latest recession reversed much of the gains. Only off-reserve Aboriginal people and people with activity limitations saw marginal improvements between 2000 and 2009 under LICO and MBM. However, when compared with the rest of the country, seniors, off-reserve Aboriginal people and people with activity limitations all had significantly lower incidences in 2009, no matter which low-income line was employed for the comparison.

During the 2000-to-2009 period British Columbia posted low-income rate reductions across two groups of at-risk people under both LICO and MBM: lone parents and people with activity limitations. Under LICO, their low-income rates dropped from 28.7% to 14.8% and from 20.6% to 14.3%, respectively, while under MBM, the corresponding changes were: from 34.8% to 18.1% and from 20.7% to 14.8%. However in 2009, none of the at-risk groups of individuals had significantly different low-income rates than their counterparts in the rest of the country.

Low income groups across cities

Montréal saw remarkable improvements for lone parents in the nine-year period from 2000 to 2009. In 2000, low-income rates for lone parents were 42.8% under LICO; 42.9%, LIM; and 36.2%, MBM. These were practically the highest among lone parents living in large cities. But by 2009, the corresponding low-income rates dropped to 23.6% under LICO; 28.9% under LIM; and 22.0% under MBM. Children and people with activity limitations living in Montréal also saw declining low-income rates under LICO, but not under the two other lines. However, the low-income rate for seniors increased under the MBM. When compared with the averages of the seven large cities, none of the vulnerable groups in Montreal had a higher incidence in 2009 under any of the three low-income lines.[44]

Ottawa–Gatineau posted no significant changes in low income among the several vulnerable groups we examined and their low-income rates were not different from the corresponding city averages over the 2000 to 2009 period. The only group that had significant (under LICO) or marginally significant (under LIM and MBM) lower incidences were seniors.

Toronto's positive development during the 2000-to-2009 period was the declining low-income rate among lone parents. In 2000, the low-income rate for lone parents in Toronto was 30.3% under LICO and 28.7% under MBM. By 2009, both had dropped to 14.5%. But the low-income rate among people with activity limitations increased under both LIM and MBM. In 2000, their incidence was 9.5% and 10.0% respectively, increasing to 20.1% and 18.7% in 2009. The low-income rate among unattached non-elderly persons also increased in that period, but the increase was significant only under LICO and marginally significant under MBM.

Winnipeg saw improvements in low income among children, lone parents, off-reserve Aboriginal people and people with activity limitations, but only under the LICO. Under the other two thresholds, not much change was observed during the 2000-to-2009 period. On the other hand, the low-income rate for children in 2009 was significantly lower than the city average, while the low-income rate for lone parents was significantly higher than the city average.

Calgary and Edmonton's relatively small sample sizes for various vulnerable groups did not allow us to make many comparisons. The only group we could identify as having improved their low-income rate during the 2000-to-2009 period was people with activity limitations from Edmonton, for whom the incidence dropped from 18.2% to 8.9% under the LICO. But compared to the city averages, several groups did well in 2009 in these two cities. In Calgary, seniors, children and people with activity limitations all saw lower incidences than the city averages under the different low income thresholds. On the other hand, in Edmonton, while both seniors and people with activity limitations had a lower incidence in 2009 under the three thresholds, the low-income incidence for children under MBM was significantly higher than the city average.

Vancouver's lone parents experienced some reduction in the low-income rate under the LICO. In 2000, their low-income rate was 30.2% and by 2009 this rate had dropped to 9.4%. There

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44. New immigrants had fewer than 100 observations in Montreal and were thus not examined.

were some drops under LIM and MBM, but these were not statistically significant due to small sample sizes.[45] The incidence of low-income was higher among seniors in 2009 under LIM and MBM, although these increases were only marginal. On the other hand, the incidence of low income for vulnerable groups was not much different than that of the general Vancouver population under all low-income lines in 2009.

Summary

The low-income rates evolved in different ways across the provinces and cities. Some provinces and cities benefited a great deal from the overall economic growth of the decades leading up to 2008. Significant progress was made in Alberta, Prince Edward Island, and Newfoundland and Labrador, as well as in Edmonton, Calgary, and Winnipeg. At the same time, improvements were seen with respect to low income for children and lone parents in most provinces and cities. However, the recent recession had an important impact on low income in several provinces and cities, most notably Alberta and its capital city Edmonton.

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45. There were only 103 observations in 2009 for lone parents living in Vancouver.

Table 4.1 Low-income rates for at-risk groups in provinces, 2000 and 2009

	2000				2009		
	LICO	LIM	MBM		LICO	LIM	MBM
				%			
Newfoundland and Labrador							
All persons	13.2	21.4	20.5		7.0	15.7	13.2
Children	17.9	29.6	28.5		9.3	20.9	19.3
Seniors	3.6	17.1	12.0		1.7	21.1	6.0
Lone-parents	44.4	63.1	58.8		14.2	47.3	46.0
Unattached non-elderly	43.0	35.2	47.6		37.1	41.6	48.0
Off-reserve aboriginal	F	F	F		10.4	19.5	18.2
Activity limited	17.7	30.5	27.9		11.3	21.8	16.5
Prince Edward Island							
All persons	9.1	15.7	14.6		4.8	12.0	8.8
Children	7.7	18.6	16.8		6.4	16.3	11.2
Seniors	5.9	13.4	8.6		2.2	10.8	8.6
Lone-parents	19.2	42.3	38.5		19.0	42.1	35.9
Unattached non-elderly	38.5	36.6	40.4		F	F	F
Activity limited	11.4	17.3	14.3		7.0	15.3	12.7
Nova Scotia							
All persons	11.6	15.9	14.2		8.0	16.9	13.1
Children	12.6	18.9	17.0		8.2	20.1	14.4
Seniors	5.7	17.0	8.0		3.4	19.3	8.7
Lone-parents	29.0	42.1	39.9		19.9	39.9	35.9
Unattached non-elderly	39.1	30.6	40.5		29.8	37.6	39.3
Off-reserve aboriginal	F	F	F		17.1	29.7	24.9
Activity limited	16.4	23.3	19.3		9.3	24.9	19.1
New Brunswick							
All persons	9.2	14.8	13.7		6.7	14.6	11.2
Children	10.8	18.4	16.2		7.5	17.5	14.6
Seniors	3.4	12.3	7.6		1.3	15.5	4.7
Lone-parents	33.0	47.9	44.5		22.7	43.4	40.8
Unattached non-elderly	37.6	32.3	42.0		30.1	37.4	37.3
Off-reserve aboriginal	F	F	F		9.3	18.3	16.4
Activity limited	11.9	18.8	16.7		10.4	20.1	14.9
Quebec							
All persons	14.8	15.0	11.6		9.4	13.7	9.5
Children	16.1	17.9	13.7		7.7	12.8	8.9
Seniors	12.1	11.1	1.8		7.7	16.3	4.7
Lone-parents	37.9	40.3	36.0		18.2	28.4	21.0
Unattached non-elderly	39.3	29.8	32.7		29.9	31.2	29.2
Recent immigrants	37.7	31.8	27.0		24.0	37.2	25.4
Off-reserve aboriginal	17.2	17.7	13.4		22.8	26.8	19.8
Activity limited	26.2	24.9	19.0		15.7	22.4	14.1

Table 4.1   Low-income rates for at-risk groups in provinces, 2000 and 2009 (continued)

	2000 LICO	2000 LIM	2000 MBM	2009 LICO	2009 LIM	2009 MBM
			%			
Ontario						
All persons	10.8	10.1	9.9	10.1	13.1	10.5
Children	12.9	13.0	12.1	10.1	14.6	11.1
Seniors	6.1	4.7	3.5	4.3	8.8	3.4
Lone-parents	29.0	31.7	28.3	18.2	30.1	20.5
Unattached non-elderly	35.0	26.1	30.9	42.1	32.4	37.6
Recent immigrants	24.9	19.3	21.0	16.0	17.9	13.7
Off-reserve aboriginal	12.2	13.1	12.1	11.2	22.3	11.7
Activity limited	13.8	13.1	11.2	14.4	20.1	14.7
Manitoba						
All persons	13.4	14.4	10.8	8.9	15.3	9.7
Children	16.9	21.5	15.1	9.1	15.2	11.6
Seniors	9.4	8.5	2.1	6.2	11.1	3.6
Lone-parents	42.2	47.9	40.7	21.9	50.0	24.2
Unattached non-elderly	37.8	22.5	28.2	27.3	25.8	27.4
Off-reserve aboriginal	27.3	30.2	22.3	13.5	25.5	17.2
Activity limited	16.1	16.0	10.5	12.1	16.2	12.7
Saskatchewan						
All persons	10.9	16.8	13.2	7.0	11.7	9.5
Children	13.2	22.4	17.2	9.7	15.2	13.3
Seniors	2.5	10.5	2.1	1.2	13.4	3.0
Lone-parents	36.5	48.5	43.2	29.4	44.4	37.3
Unattached non-elderly	37.8	33.6	36.8	22.7	26.4	28.0
Off-reserve aboriginal	24.0	31.3	25.4	20.3	24.4	25.8
Activity limited	11.9	16.7	13.2	8.8	14.5	10.9
Alberta						
All persons	11.1	10.3	11.0	7.7	9.1	9.9
Children	12.5	13.0	12.6	9.3	12.8	13.3
Seniors	2.4	2.2	2.0	1.9	2.5	1.6
Lone-parents	28.9	27.5	30.3	14.2	23.1	23.7
Unattached non-elderly	36.5	22.9	32.2	22.9	21.8	26.3
Recent immigrants	19.0	22.7	19.6	15.6	17.1	14.6
Off-reserve aboriginal	18.3	16.1	20.0	6.9	10.2	8.6
Activity limited	14.9	12.8	14.0	7.8	10.4	9.9

Table 4.1   Low-income rates for at-risk groups in provinces, 2000 and 2009 (continued)

	2000			2009		
	LICO	LIM	MBM	LICO	LIM	MBM
			%			
British Columbia						
All persons	15.1	14.9	16.8	12.0	15.1	13.0
Children	14.2	15.8	18.4	12.0	17.9	13.9
Seniors	9.6	7.3	4.5	7.3	12.1	6.2
Lone-parents	28.7	33.1	34.8	14.8	25.4	18.1
Unattached non-elderly	38.3	27.5	36.4	28.4	30.0	28.0
Recent immigrants	29.2	25.6	25.1	24.6	25.1	25.2
Off-reserve aboriginal	24.6	30.2	32.3	17.4	23.5	20.0
Activity limited	20.6	20.3	20.7	14.3	18.5	14.8

F too unreliable to be published

Source: Survey of Labour and Income Dynamics, 2000 and 2009, Statistics Canada.

Table 4.2 Low-income rates for at-risk groups in cities, 2000 and 2009

	2000			2009		
	LICO	LIM	MBM	LICO	LIM	MBM
	%					
Montreal						
all people	19.7	15.8	13.4	13.1	15.0	11.6
Children	23.1	20.3	16.6	11.9	15.5	11.2
Seniors	18.9	10.3	2.2	12.9	15.0	6.7
Lone-parents	42.8	42.9	36.2	23.6	28.9	22.0
Unattached non-elderly	39.7	25.4	30.5	34.6	32.6	31.0
Activity limited	34.8	26.6	22.0	19.3	21.9	15.4
Ottawa-Gatineau						
all people	14.6	11.8	12.2	9.3	9.7	9.3
Children	13.5	12.1	12.4	9.2	10.0	10.1
Seniors	13.5	7.3	5.0	4.5	7.1	2.4
Lone-parents	27.9	26.5	28.2	25.2	27.8	25.2
Unattached non-elderly	39.6	24.1	33.4	F	F	F
Activity limited	20.6	18.1	15.0	14.3	14.4	14.1
Toronto						
all people	12.4	9.3	10.4	13.2	13.2	12.3
Children	17.4	13.9	14.7	13.6	14.4	12.8
Seniors	10.2	4.7	5.8	8.4	11.3	6.2
Lone-parents	30.3	25.0	28.7	14.5	20.0	14.5
Unattached non-elderly	28.1	20.6	26.1	48.7	26.4	40.9
Recent immigrants	22.8	16.3	18.5	17.6	16.3	14.1
Activity limited	14.3	9.5	10.0	18.7	20.7	18.1
Winnipeg						
all people	16.2	11.4	9.1	10.6	12.4	8.3
Children	19.1	15.8	11.0	11.9	16.1	8.3
Seniors	14.8	7.2	1.8	9.7	11.0	3.6
Lone-parents	46.9	45.4	34.3	29.5	50.4	20.8
Unattached non-elderly	42.9	22.1	29.4	F	F	F
Off-reserve aboriginal	31.5	23.9	18.7	13.6	23.5	13.8
Activity limited	22.1	16.0	11.3	13.6	13.2	11.3
Calgary						
all people	10.0	7.0	8.9	8.6	7.3	8.2
Children	8.7	7.8	9.1	7.7	8.0	8.5
Seniors	3.3	2.6	1.3	4.2	2.8	2.8
Unattached non-elderly	35.1	17.5	27.3	F	F	F
Activity limited	12.8	9.4	11.2	10.2	9.9	8.3

Table 4.2 Low-income rates for at-risk groups in cities, 2000 and 2009 (continued)

	2000			2009		
	LICO	LIM	MBM	LICO	LIM	MBM
	%					
Edmonton						
all people	13.7	10.1	10.1	10.5	10.1	12.0
Children	19.7	15.4	14.1	15.4	17.6	19.2
Seniors	4.1	1.2	1.8	1.9	2.9	1.1
Lone-parents	F	F	F	23.5	30.0	31.7
Unattached non-elderly	35.4	20.7	28.3	F	F	F
Activity limited	18.2	13.7	14.1	8.9	9.0	9.7
Vancouver						
all people	17.8	14.0	14.8	16.9	16.9	16.5
Children	16.2	13.6	13.9	17.1	19.7	17.7
Seniors	15.6	7.1	4.8	13.8	14.7	10.0
Lone-parents	30.2	20.5	20.5	9.4	14.1	10.8
Unattached non-elderly	35.4	21.4	29.0	28.1	28.1	26.1
Recent immigrants	31.1	26.7	26.6	26.3	26.3	26.9
Activity limited	23.6	16.1	16.2	20.5	21.8	19.4

F too unreliable to be published

Source: Survey of Labour and Income Dynamics, 2000 and 2009, Statistics Canada.

Chapter 5 The dynamics of low income in Canada

In the previous chapters, we looked at the trends in low income in Canada. We now turn to a new set of questions on the dynamics of low income. Are the same people in low income year after year or are different people going in and out of low income? For those who fall into low income, how long does it take them to get out? This chapter attempts to answer these questions by looking at the proportion of people who experienced multiple spells of low income, the transition rates in and out of low income, the re-entry rate and the duration and persistence measures of low income under all three low-income lines.

To address the questions above, we followed the same people over time using the Survey of Labour and Income Dynamics (SLID). The data enabled us to examine the annual dynamics of low income in Canada as well as the longer term dynamics for several six-year periods: 1993 to 1998, 1996 to 2001, 1999 to 2004 and 2002 to 2007 and to correlate the dynamics of low income with key individual and family characteristics.[46]

Rates of transition to and from low income

Low-income dynamics describe the flow of people in and out of low income and the length of their stay in low income. The time span underlying the low-income transition matrix can be long or short. We first look at the pattern of year-to-year transitions under the low-income cut-offs (LICO), low-income measure (LIM) and market basket measure (MBM).

Table 5.1 may help illustrating several concepts of low income transitions. The rate at which people enter into low income between any two adjacent years, say 2008 and 2009, is the proportion of people who fell into low income in 2009 as a share of people who were not in low income in 2008. This is represented by $P_{NL \to L}$ in Table 5.1. The exit rate measures the proportion of people who exit low income in, say, 2009, as a share of people who were in low income in 2008. The exit rate is represented by $P_{L \to NL}$ in the table. The other two elements of the table, $P_{L \to L}$ and $P_{NL \to NL}$, measure immobility of and resistance to low income, respectively. The former represents the proportion of population who stayed in low income in both years, while the later represents the proportion of the population who stay out of low income in both years.[47]

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46. An alternative source that would allow longer periods than six years is the Longitudinal Administrative Databank (LAD), which is constructed from a 20% random sample of Canadians' income tax records. Its sample size is huge, and it covers a much longer period of time than SLID. However, the LAD has few individual characteristics, and as the census family is the basic unit of observation for LAD, none of the three low-income lines—low-income cut-off (LICO), low-income measure (LIM) or market basket measure (MBM)—that we have employed is applicable in LAD. However, it is not impossible to construct a LIM line in the database to study low-income dynamics. For an example, see Finnie and Sweetman (2003). We leave this for future research.
47. Note that $P_{L \to L} + P_{L \to NL} = 1$ and $P_{NL \to L} + P_{NL \to NL} = 1$.

Table 5.1 An illustration of the low-income transition matrix, 2008 to 2009

		2009	
		In low income (L)	Not in low income (NL)
2008	In low income (L)	$P_{L\to L}$ (immobility)	$P_{L\to NL}$ (exit rate)
	Not in low income (NL)	$P_{NL\to L}$ (entry rate)	$P_{NL\to NL}$ (resistance)

Table 5.2 contains our estimates of the four elements of the transition matrices under different lines, from the 1993-to-1994 period to the 2007-to-2009 period. It shows that many people who fell into low income in one year were able to exit it in the next year. Under LICO, the one-year exit (or escape) rate, $P_{L\to NL}$, varied from 28% to 40% in the 15 two-year periods from 1993 to 2009. Under LIM, the exit rate changed from 29% to 38% in the same period. While under MBM, in the eight two-year periods from 2000 to 2009, it ranged from 35% to 42%.

However, the underlying trends in the low-income exit rates under different lines were mixed. Over time, the rates increased slightly under LICO and decreased slightly under LIM, while under MBM, no clear trend could be detected, although in more recent years, i.e., from the 2006-to-2007 period to the 2008-to-2009 period, the exit rates declined under all of the three low-income lines, most notably under LICO and MBM. Notice that the immobility measure, $P_{L\to L}$, changed in the opposite direction as the exit rate. Again, no clear trend can be detected, except those from the 2006-to-2007 period to the 2008-to-2009 period in which immobility rose under both LICO and MBM.

Table 5.2 The one year transition matrices of low income, 1993 to 2009

Period	$P_{L \to L}$ (immobility)	$P_{L \to NL}$ (exit rate)	$P_{NL \to L}$ (entry rate)	$P_{NL \to NL}$ (resistance)
		Under LICO		
1993 to 1994	71.8	28.2	5.5	94.5
1994 to 1995	66.7	33.3	4.9	95.1
1995 to 1996	70.4	29.6	4.0	96.0
1996 to 1997	69.9	30.1	4.7	95.3
1997 to 1998	66.1	33.9	3.7	96.3
1998 to 1999	66.1	33.9	4.3	95.7
1999 to 2000	66.3	33.7	4.0	96.0
2000 to 2001	60.9	39.1	3.1	96.9
2001 to 2002	68.1	31.9	3.6	96.4
2002 to 2003	67.7	32.3	3.8	96.2
2003 to 2004	66.3	33.8	3.4	96.6
2004 to 2005	66.7	33.3	3.0	97.0
2005 to 2006	64.8	35.2	3.2	96.8
2006 to 2007	60.2	39.8	2.5	97.5
2007 to 2008	63.1	36.9	3.0	97.0
2008 to 2009	67.2	32.8	3.2	96.8

Table 5.2   The one year transition matrices of low income, 1993 to 2009
(continued)

Period	$P_{L \to L}$ (immobility)	$P_{L \to NL}$ (exit rate)	$P_{NL \to L}$ (entry rate)	$P_{NL \to NL}$ (resistance)
		Under LIM		
1993 to 1994	66.2	33.8	5.4	94.6
1994 to 1995	62.4	37.6	4.9	95.1
1995 to 1996	68.2	31.8	4.0	96.0
1996 to 1997	66.5	33.5	4.5	95.5
1997 to 1998	67.3	32.7	4.4	95.6
1998 to 1999	63.0	37.0	4.6	95.4
1999 to 2000	67.9	32.1	4.7	95.3
2000 to 2001	64.3	35.7	4.0	96.0
2001 to 2002	70.8	29.2	4.0	96.0
2002 to 2003	69.2	30.8	4.6	95.4
2003 to 2004	70.3	29.7	4.2	95.8
2004 to 2005	68.6	31.4	4.0	96.0
2005 to 2006	68.5	31.5	3.9	96.1
2006 to 2007	69.8	30.2	3.6	96.4
2007 to 2008	68.2	31.8	4.6	95.4
2008 to 2009	70.3	29.7	4.3	95.7

Table 5.2   The one year transition matrices of low income, 1993 to 2009
            (continued)

Period	$P_{L \to L}$ (immobility)	$P_{L \to NL}$ (exit rate)	$P_{NL \to L}$ (entry rate)	$P_{NL \to NL}$ (resistance)
	Under MBM			
2000 to 2001	58.0	42.0	3.5	96.5
2001 to 2002	63.8	36.2	3.8	96.2
2002 to 2003	61.3	38.7	3.8	96.2
2003 to 2004	63.7	36.3	3.6	96.4
2004 to 2005	62.5	37.5	3.7	96.3
2005 to 2006	61.7	38.3	3.3	96.7
2006 to 2007	57.6	42.4	2.7	97.3
2007 to 2008	65.0	35.0	3.8	96.2
2008 to 2009	65.4	34.6	4.3	95.7

Source: Survey of Labour and Income Dynamics (1993 to 2009).

The entry rates, $P_{NL \to L}$, under LICO, LIM and MBM appeared to follow a declining trend under all three low-income lines from the 1993-to-1994 period to the 2006-to-2007 period. In the 1993-to-1994 period, entry rates under LICO and LIM were slightly above 5%. In the period from 2000 to 2001, entry rates under all three lines varied from 3% to 4%. By the 2006-to-2007 period, they dropped to their respective historic lows. They all started to edge up thereafter. The entry rate even reached a historically high of 4.3% under MBM during the 2008-to-2009 period. These changes can also be observed from Figure 5.1 (top panel).

The declining entry rate implies that the resistance to low-income, $P_{NL \to NL}$, under different lines should have increased over time since $P_{NL \to NL} = 1 - P_{NL \to L}$. In the 1993-to-1994 period, about 95% of Canadians who were not in low income in 1993 stayed out of low income in the next year, under both LICO and LIM. In the 2000-to-2001 period, this measure varied from 96% to 97% under the three lines. By the 2006-to-2007 period, the measures reached their historic highs, especially under LICO and MBM. However, the latest recession pulled the resistance rate down slightly. Figure 5.1 (bottom panel) plots the overall evolution of Canadians' ability to resist low income.

Figure 5.1   Low income entry (top) and resistance (bottom) under different lines: 1993 to 1994 period to 2008 to 2009 period
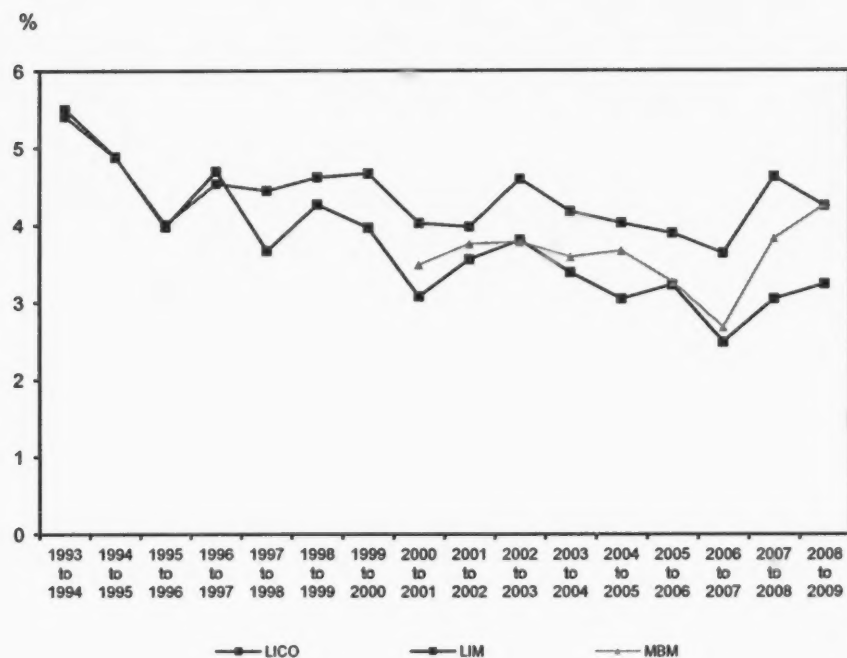
Figure 5.1   Low income entry (top) and resistance (bottom) under different lines: 1993 to 1994 period to 2008 to 2009 period (continued)
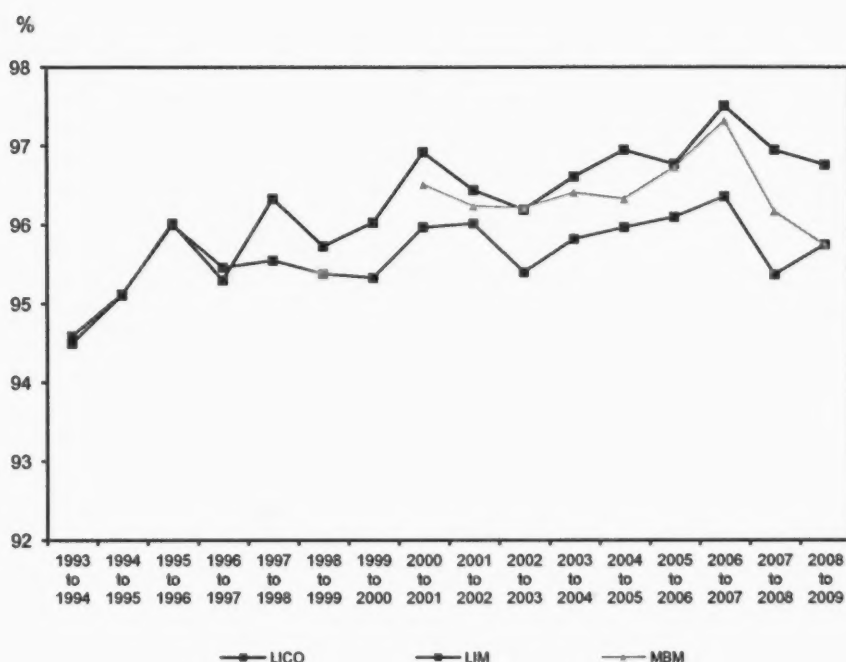
Multiple spells of low income

The previous section drew a picture of how Canadians enter, stay in and exit low income. However, low-income dynamics may also be examined by looking at the incidence of multiple low-income spells, both for the overall population and for various groups of people. In both cases, if the proportion of people experiencing low income continuously in a period is high, then low-income persistence is strong. Otherwise, if the proportion is low and many people experience low income for at most one or two years, low income would be characterized as transitory. Between the extreme cases, if a person experienced low income for a substantial number but not all years within a given period, the person is usually identified as experiencing chronic or recurrent low income.

The results based on data from SLID are shown in Table 5.3. An immediate observation is that low income in Canada is largely transitory. More people experience low income for at least one

year in a six-year period than did people in any particular year. For example, from 2002 to 2007, from 20% to 24% of Canadians experienced low income in at least one year under LICO, LIM and MBM, while in any particular year, low income rates under the three lines varied from 9% to 13% during that period.[48] At the same time, fewer people experienced low income for more than four years or for all six years in the panel. For example, under MBM, only 1.4% of Canadians had low income in every year from 2002 to 2007. The corresponding proportions were 2.1% under LICO and 3.5% under LIM, suggesting that persistent or chronic low income was unlikely to affect a large proportion of the Canadian population.

As well, low-income dynamics between high-risk groups varied a great deal. The groups most affected by persistent low income were non-elderly unattached people and lone parents. In the period from 1993 to 1998, 51% to 61% of non-elderly unattached people experienced low income for at least one year under LIM and LICO. Nearly one in four of them was in low income for all six years under LIM, and under LICO one in three was in low income for six years. The situation improved over time. By the 2002-to-2007 period, 13% to 17% of unattached non-elderly people were in low income for all six years under MBM, LICO and LIM. Even so, low-income persistency among them was still the strongest relative to other vulnerable groups.

As documented by Richards (2010), low-income incidence among lone parents declined substantially during the past decade. After examining their low-income dynamics, we found that, similar to people from unattached non-elderly group, lone parents experienced a high transitory low-income rate. The proportion of lone parents in low income for at least one year from 1993 to 1998 was 59% under LICO and 62% under LIM. By the 2002-to-2007 period, it varied from 48% under LICO to 57% under LIM to 53% under MBM. These indicate that transitory low income declined over time for this group. But the transitory low income of lone parents was the highest among all vulnerable groups in the latest period. Furthermore, lone parents also experienced a persistently high level of low income, second only to unattached non-elderly people. Similar to the latter, the persistence of low income declined among lone parents over the 1993–to-2007 period, although the decline among them was not as strong as that among unattached non-elderly people.

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48. See Table 2.1 for low-income rates in a particular year in this period.

Table 5.3 Multiple spells of low income across groups of people

	Low income in one year or more			Low income in four years or more			Low income in six years		
	LICO	LIM	MBM	LICO	LIM	MBM	LICO	LIM	MBM
Overall									
1993 to 1998	24.5	23.5	..	8.6	7.4	..	3.6	2.8	..
1996 to 2001	25.4	25.0	..	8.0	7.8	..	3.4	2.8	..
1999 to 2004	20.0	22.6	..	5.5	7.2	..	2.5	2.9	..
2002 to 2007	20.0	23.6	19.5	5.1	7.3	4.4	2.1	3.5	1.4
Children									
1993 to 1998	27.7	27.7	..	10.6	11.0	..	4.7	4.4	..
1996 to 2001	28.9	30.2	..	10.3	11.7	..	3.9	4.0	..
1999 to 2004	22.3	26.1	..	6.5	9.1	..	2.5	4.3	..
2002 to 2007	21.8	25.9	21.4	5.7	9.6	5.5	1.8	3.5	1.7
Seniors									
1993 to 1998	15.7	F	..	6.2	F	..	3.5	F	..
1996 to 2001	13.8	14.0	..	6.0	3.5	..	4.0	1.1	..
1999 to 2004	11.8	16.8	..	3.6	5.2	..	1.9	1.7	..
2002 to 2007	12.2	18.3	7.6	4.8	6.6	F	2.8	3.5	F
Lone parents									
1993 to 1998	58.6	62.2	..	42.8	39.1	..	20.9	21.3	..
1996 to 2001	61.0	60.2	..	30.4	40.1	..	16.0	18.0	..
1999 to 2004	47.2	53.9	..	24.2	30.0	..	10.3	16.7	..
2002 to 2007	48.3	57.4	53.0	16.4	31.8	20.3	6.0	17.2	8.3
Unattached non-elderly									
1993 to 1998	60.8	51.4	..	43.8	36.4	..	33.8	24.0	..
1996 to 2001	49.6	44.5	..	37.6	31.3	..	29.2	20.6	..
1999 to 2004	48.7	45.5	..	29.4	27.9	..	21.0	17.8	..
2002 to 2007	45.6	42.4	40.6	24.3	26.0	22.3	16.3	17.2	13.0
Recent immigrants									
1993 to 1998	48.9	36.8	..	26.6	F	..	F	F	..
1996 to 2001	49.9	44.0	..	19.0	12.2	..	F	F	..
1999 to 2004	32.5	29.3	..	11.9	12.6	..	F	F	..

Table 5.3 Multiple spells of low income across groups of people (continued)

	Low income in one year or more			Low income in four years or more			Low income in six years		
	LICO	LIM	MBM	LICO	LIM	MBM	LICO	LIM	MBM
2002 to 2007	41.9	42.0	37.2	10.5	12.3	9.7	F	F	F
Off-reserve Aboriginal people									
1993 to 1998	34.6	35.6	..	14.7	13.9	..	F	6.1	..
1996 to 2001	44.0	47.7	..	13.2	18.1	..	F	6.4	..
1999 to 2004	27.4	33.3	..	8.7	12.6	..	F	3.8	..
2002 to 2007	29.2	36.3	29.4	6.5	11.8	8.0	F	4.5	3.4
People with activity limitations									
1999 to 2004	31.1	35.6	..	16.2	19.6	..	9	10.5	..
2002 to 2007	29.5	36.8	29.1	14.4	18.4	10.6	8.4	10.9	5.4

F too unreliable to be published

.. not available for a specific reference period

Source: Survey of Labour and Income Dynamics (1993 to 2007)

The proportion of people with low income for at least one year was also high among recent immigrants, people with activity limitations and off-reserve Aboriginal people. For the period from 2002 to 2007, about 40% of recent immigrants and about 30% of people from the other two groups experienced low income for at least one year under different lines. Despite the relatively high transitory low income among recent immigrants, their level of chronic low income was not as high as that of lone parents and unattached non-elderly people. People with activity limitations also had relatively high rates of persistent low income.[49] From 2002 to 2007, 8.4%, 10.9% and 5.4% of people with activity limitations had low income over all six years under LICO, LIM and MBM, respectively. These rates were lower than those for unattached non-elderly people but higher than those for virtually all other vulnerable groups.[50]

Table 5.4 Multiple spells of low income across provinces

	At least one year		At least four years		All six years	
	1993 to 1998	2002 to 2007	1993 to 1998	2002 to 2007	1993 to 1998	2002 to 2007
LICO						
Newfoundland/Labrador	23.4	17.6	10.4	4.9	3.4	2.0
Prince Edward Island	14.9	14.4	F	F	F	F
Nova Scotia	20.2	18.2	7.7	4.3	3.8	2.0
New Brunswick	21.2	16.8	6.8	6.2	2.3	2.9
Quebec	27.9	21.3	13.1	5.8	7.1	2.6
Ontario	21.4	17.9	5.7	4.0	1.8	1.6
Manitoba	26.7	23.9	11.7	9.2	4.2	2.9
Saskatchewan	23.6	19.4	6.8	3.2	2.2	F

49. The definition of people with activity limitations changed in 1999.
50. Because of small sample sizes, the proportions of low income for all six years for recent immigrants (under all three lines) and for off-reserve Aboriginal people (under LICO) were not presented. But they were not as high as for other groups.

Table 5.4 Multiple spells of low income across provinces (continued)

	At least one year		At least four years		All six years	
	1993 to 1998	2002 to 2007	1993 to 1998	2002 to 2007	1993 to 1998	2002 to 2007
Alberta	26.2	16.6	8.5	2.5	3.4	F
British Columbia	21.6	25.3	7.6	8.8	2.1	4.2
LIM						
Newfoundland/Labrador	30.2	31.0	11.8	13.1	5.4	5.8
Prince Edward Island	19.1	25.9	F	7.0	F	F
Nova Scotia	23.6	26.4	9.8	11.2	4.8	5.8
New Brunswick	24.6	27.9	9.6	13.2	4.2	6.4
Quebec	27.1	25.7	11.3	7.7	5.3	3.5
Ontario	19.4	19.6	4.6	6.0	0.9	2.1
Manitoba	26.0	27.5	10.9	10.0	4.2	4.2
Saskatchewan	27.5	33.6	7.7	9.3	2.5	3.5
Alberta	23.7	17.7	6.9	3.5	2.3	F
British Columbia	19.6	28.9	4.8	9.8	2.3	4.4
MBM						
Newfoundland/Labrador	..	25.5	..	9.0	..	3.9
Prince Edward Island	..	23.3	..	5.7	..	F
Nova Scotia	..	23.6	..	7.6	..	3.2
New Brunswick	..	23.0	..	9.0	..	4.1
Quebec	..	17.6	..	3.5	..	1.1
Ontario	..	17.2	..	3.6	..	0.8
Manitoba	..	19.8	..	6.1	..	F

Table 5.4 Multiple spells of low income across provinces (continued)

	At least one year		At least four years		All six years	
	1993 to 1998	2002 to 2007	1993 to 1998	2002 to 2007	1993 to 1998	2002 to 2007
Saskatchewan	..	23.7	..	4.2	..	F
Alberta	..	16.2	..	2.3	..	F
British Columbia	..	26.9	..	7.5	..	3.4

F too unreliable to be published

.. not available for a specific reference period

Source: Survey of Labour and Income Dynamics (1993 to 2007)

Table 5.5 Multiple spells of low income across communities

	At least one year			At least four years		
	1993 to 1998	1999 to 2004	2002 to 2007	1993 to 1998	1999 to 2004	2002 to 2007
LICO						
Montréal	35.3	26.3	24.3	20.1	8.1	7.2
Ottawa–Gatineau	26.0	18.3	16.0	13.1	F	F
Toronto	22.3	17.0	22.1	4.6	4.9	5.8
Winnipeg	27.6	20.8	27.4	14.8	7.1	12.5
Calgary	26.3	15.9	15.9	7.6	F	F
Edmonton	31.9	24.1	14.9	12.8	9.4	F
Vancouver	20.9	29.6	26.4	11.0	7.8	11.4
Other CMAs or CAs	20.6	18.1	16.8	6.8	6.0	4.4
Outside CMAs or CAs	25.6	19.5	20.5	6.8	3.5	3.4
LIM						
Montréal	29.2	24.0	23.6	13.9	6.5	5.9
Ottawa–Gatineau	20.8	17.1	14.5	6.5	F	6.3
Toronto	15.3	14.8	21.1	F	4.2	6.4
Winnipeg	22.1	15.8	26.0	9.4	5.1	9.5
Calgary	20.7	14.7	14.4	F	F	F
Edmonton	25.4	22.7	12.0	F	8.4	F
Vancouver	15.8	25.5	27.6	4.3	5.6	11.2

Table 5.5 Multiple spells of low income across communities (continued)

	At least one year			At least four years		
	1993 to 1998	1999 to 2004	2002 to 2007	1993 to 1998	1999 to 2004	2002 to 2007
Other CMAs or CAs	19.9	21.0	21.3	6.2	8.6	6.6
Outside CMAs or CAs	29.9	28.5	29.6	8.7	8.3	9.0
MBM						
Montréal	..	..	15.5	..	..	F
Ottawa–Gatineau	..	..	13.4	..	..	F
Toronto	..	..	19.2	..	..	4.5
Winnipeg	..	..	17.6	..	..	6.0
Calgary	..	..	14.1	..	..	F
Edmonton	..	..	10.1	..	..	F
Vancouver	..	..	25.5	..	..	9.3
Other CMAs/CAs	..	..	16.8	..	..	4.0
Outside CMAs/CAs	..	..	25.4	..	..	4.9

F too unreliable to be published

.. not available for a specific reference period

Source: Survey of Labour and Income Dynamics (1993 to 2007)

Rates of transitory low-income for children were only slightly higher than the population average, while the persistence of low income among children was similar to the population average, particularly in more recent years. Among seniors, rates of transitory and persistent low income were relatively low under LICO. But under LIM, transitory and persistent measures increased over time from 1993 to 2007 for seniors, indicating that their incomes did not grow as much as that of the general Canadian population.

Table 5.4 contains results related to multiple low-income spells across provinces. The persistence of low income declined substantially in Alberta from 1993 to 2007. In the 1990s, the proportion of Albertans experiencing low income for at least four years was close to the national average. By the 2002-to-2007 period, it fell to a level far below the national one. Quebec also experienced substantial improvements in this period. During the 1993-to-1998 period, the persistence of low income in Quebec was almost the greatest among all provinces, but during the most recent period, 2002-2007, it dropped to a level close to the national average. In contrast, the persistence of low income in British Columbia increased over time. In the early 1990s, the proportion of British Columbia residents who experienced low income for four years was below the national averages under both LICO and LIM. By the 2002-to-2007 period, the proportion of people in low income for at least four years exceeded the national average under both lines.

In contrast, the persistence of low income in Ontario was mixed, with different low income lines giving different results. Under LICO, the persistence improved between the 1993-to-1998 and the 2002-2007 periods, while under LIM, the situation appeared to deteriorate between the two periods. However, when we compared the persistence measures of the province with those of the country, we found that low income persistence in Ontario was consistently below the national level.

Not surprisingly, the changes across provinces were mirrored in the changes across the largest cities in these provinces (Table 5.5). For example, the proportion of people in low income for at least four years dropped substantially in Montréal from 1993 to 2007 under LICO and LIM, and there was also a decline in Edmonton under the LICO.[51] In contrast, the proportion of people in Vancouver experiencing low income for at least four years either increased (under LIM) or stayed at a relatively high level over time (under LICO), while in Toronto there was evidence to suggest that low income persistence had increased over time.

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51. The proportions for Edmonton and Calgary also dropped, but unfortunately, the samples for these cities were small and it was difficult to evaluate the changes precisely.

An alternative measure of chronic and persistent low income

While low-income persistence and recurrence can be measured by the number of years in low income within an observation window, the measurements have some limits. For example, they do not measure the depth of low income. Consider two people. One is in low income all years but in each year his or her income is only slightly below the threshold. The other person is in low income for only two years, but in each year, this person's income is far below the threshold. The measures used in the previous section would identify the first person as in persistent low income while the second would be treated as in transitory low income. Yet the second person might have to borrow against future income to cope with the severe low income of a particular year and, as a result, may have less income to consume in future years. Even if his or her income would not be considered 'low' in those years, he or she would be more likely to live in straitened circumstances.

To deal with the problem, we use a version of the long-term low-income incidence measure developed by Rodgers and Rodgers (1993). We follow Velleta (2005) to compare average after-tax income (or disposable income under MBM) of an economic family (or of household under LIM) over a period of time with the corresponding average low-income threshold. If the average income is below the average threshold, the family is identified as in persistent or chronic low income.[52] The long-term low-income status of a family or household is then assigned to each member. The results are presented in Table 5.6.

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52. This simplified version of incidence long-term low income essentially assumes that the discount rate for future income is 0.

Table 5.6 Incidence of long-term low income, using an alternative measure of persistence

	1993 to 1998		1996 to 2001		1999 to 2004		2002 to 2007		
	LICO	LIM	LICO	LIM	LICO	LIM	LICO	LIM	MBM
Overall	8.9	8.0	8.4	8.5	6.0	7.7	5.1	8.1	4.8
Groups of people									
Children	11.9	12.0	11.2	12.5	7.0	10.1	5.7	10.5	6.1
Seniors	6.1	1.9	6.3	4.3	3.3	4.9	4.4	6.7	0.7
Lone parents	46.5	36.6	35.6	31.6	30.1	28.7	24.1	25.6	23.3
Unattached non-elderly	44.9	42.3	32.9	40.4	22.2	28.2	19.3	38.4	22.3
Recent immigrants	22.4	16.3	23.4	15.8	13.6	14.0	11.9	14.8	10.8
Off-reserve Aboriginal people	14.1	16.0	13.0	19.8	9.7	14.3	5.8	14.5	7.4
Activity limited	..	..	..	..	15.8	19.3	15.2	21.0	11.4
Provinces									
Newfoundland/Labrador	9.5	13.1	10.3	15.2	9.6	20.4	5.0	12.9	8.1
Prince Edward Island	3.4	4.5	4.3	9.1	3.0	11.2	2.2	8.5	5.3
Nova Scotia	7.6	10.6	8.0	12.8	8.0	14.0	5.7	12.1	7.7
New Brunswick	8.2	12.8	5.7	10.9	5.5	13.4	6.0	13.7	10.1
Quebec	14.3	12.8	12.9	11.4	7.2	9.4	6.2	9.9	3.9
Ontario	5.6	4.7	6.5	5.8	4.6	5.0	3.7	6.2	4.2
Manitoba	10.8	10.0	9.5	11.0	6.2	10.0	9.8	11.0	5.8
Saskatchewan	7.1	9.2	5.2	11.8	5.5	10.8	3.5	12.2	4.6
Alberta	8.4	6.7	6.3	7.0	7.1	7.6	2.2	3.0	2.7
British Columbia	8.2	5.5	8.0	8.1	6.4	7.1	8.1	9.8	7.9

Table 5.6 Incidence of long-term low income, using an alternative measure of persistence (continued)

	1993 to 1998		1996 to 2001		1999 to 2004		2002 to 2007		
	LICO	LIM	LICO	LIM	LICO	LIM	LICO	LIM	MBM
Communities									
Montréal	21.5	17.5	19.6	13.0	9.0	7.0	8.2	8.9	3.2
Ottawa–Gatineau	12.7	5.3	10.7	8.6	3.0	1.8	6.2	7.1	4.4
Toronto	5.4	2.9	9.0	5.0	6.1	4.6	4.7	6.2	5.0
Winnipeg	14.5	9.0	11.7	8.1	8.3	6.2	12.9	10.9	5.7
Calgary	8.3	5.9	6.3	4.5	7.1	5.0	2.3	3.2	2.3
Edmonton	13.8	7.5	6.6	5.5	10.9	10.4	2.9	2.0	2.1
Vancouver	11.9	4.7	10.9	8.6	8.7	6.2	11.1	11.2	10.1
Other CMAs/CAs	7.2	6.4	7.3	7.8	6.3	9.0	4.5	7.4	4.3
Outside CMAs/CAs	4.2	9.0	3.6	10.9	3.0	9.8	2.5	11.0	5.2

.. not available for a specific reference period

Note: The alternative measure of persistence was developed by Rodgers and Rodgers (1993). CMA, census metropolitan area; CA, census agglomeration

Source: Survey of Labour and Income Dynamics (1993 to 2007)

Across the at-risk groups, the results under the alternative measure of persistence are consistent with findings from the previous section. The incidences of long-term low income for unattached non-elderly people and lone parents declined from 1993 to 2007, but by the most recent period, these two groups still had the highest long-term incidences among all at-risk groups. The persistence of low income among people with activity limitations was also high: although it was not as high as among unattached non-elderly people and lone parents. However, persistence of low income of people with activity limitations was still more than twice as high as the national average. Furthermore, from 1999 to 2007, the persistence of low income under LICO and LIM changed little for people in this group, while considerable improvements occurred among other vulnerable groups in this period.

The results show that, first, the improvements in the persistence of low income in Alberta and Quebec and the deterioration of it in British Columbia, which were identified in the previous section, were also observed under the alternative measure. Under LICO, the incidence of long-term low income in Alberta dropped from about 8% in the first period (1993 to 1998) to 2% in the last period (2002 to 2007), while under LIM, it dropped from about 7% to 3%. In Quebec, the incidence dropped from 14% to 6% under LICO and from 13% to 10% under LIM in the same period. In contrast, the incidence of long-term low income in the province of British Columbia either stayed relatively high or increased between the two periods. Under LIM, the incidence increased from less than 6% to almost 10%, while under LICO, it stayed at around 8%. However, the relatively stable long-term incidence under LICO does not mean that British Columbia was not worse off over time because nationally, the incidence declined and the declines in all other provinces were considerably larger than in British Columbia.

As for persistence of low income in Ontario, the alternative measure confirmed our findings under the multiple spell approach: the trends varied under different low income lines. Under LICO, some improvement occurred between the first and the last periods of observation (1993 to 1998 vs. 2002 to 2007), while results under LIM seemed to suggest a different story. Nevertheless, the results again suggested that low income persistence in Ontario was below that at the Canada level when the Rodgers and Rodgers (1993) approach was employed.

The alternative measure provided more useful information for different communities than did the multiple spell approach. It is now clearer that persistent low income dropped, sometimes substantially, in Edmonton, Calgary and Montréal from 1993 to 2007. For Edmonton, in the 1993-to-1998 period, incidence of long-term low income was above or very close to the national average of 8%-to-9%. By the 2002-to-2007 period, it dropped to the 2%-to-3% level. This low level was also seen in Calgary, although the incidence of long-term low income there was already below the national average as far back as the 1993-to-1998 period. The incidence of long-term low income also dropped significantly in Montréal. Under LICO, it dropped from 21% in the 1993-to-1998 period to 8% in the 2002-to-2007period, and under LIM, from 17% to 9%. In the 1993-to-1998 period, Montréal had the highest long-term incidences of low income across the country, at more

than twice the national average. By the most recent period, its long-term incidences were much closer to the national averages.[53]

The situation in Vancouver was different. Under LICO, the incidence of long-term low income stayed the same over time. In the 1993-to-1998 period, it was at about 12%. By the 2002-to-2007 period, it was still at about 11%, and the incidence under LIM increased from about 5% to 11%. In the most recent period of observation, Vancouver had a higher incidence of long-term low income compared to most of the large cities under all three low-income lines. The only exception was Winnipeg, where the incidence of long-term low income under LICO and LIM were similar to Vancouver's. However, under the MBM, the incidence in Winnipeg was lower than in Vancouver, and in the period from 1993 to 1998, the incidences under both LICO and LIM were considerably higher in Winnipeg than they were in Vancouver, suggesting that the decline in the persistence of low income in Winnipeg was probably much stronger than in Vancouver.

Finally, in Toronto, although long-term low income incidence had not been much higher than that of other cities in recent years, a deteriorating trend seemed to appear. In the period from 1993 to 1998, the incidences under both LICO and LIM were the lowest in Toronto among the major cities. These incidences varied over time, but by the period of 2002-to-2007, they were higher than those of Edmonton and Calgary.

The duration of low income

The majority of those who fell into low income in one year were not able to escape it in the next year. The question is how many years, on average, would a person in low income stay there? Given that each panel of SLID observes a person for at most six years, estimates of the duration of low income is subject to the caveat of left and right censoring of a low-income spell. Left censoring occurs if, in the first year of observation, the person in question was already in low income and it is unknown whether he or she was in low income in the years before the observation. Right censoring happens when a person is in low income in the last year of observation and we do not know if he or she would continue to be in low income in years after the observation. As a result, the average length of low-income spells will generally underestimate the true duration when censoring is ignored.[54]

Nevertheless, the estimated duration provides a lower boundary for each group, and comparisons of spell length across groups in the same period and over the years are still

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53. However, in the incomplete panel of Survey of Labour and Income Dynamics, from 2005 to 2009, the incidence of long-term low income increased again in Montréal and, to a lesser extent, in Toronto and Calgary, while they decreased in Vancouver.
54. Further, it may be that the longer the spell has lasted, the lower the probability it will end in the next period.

valid.[55] Table 5.7 presents the estimated average duration of all low-income spells (completed or censored) in each panel of SLID. Overall, the average low-income spells last more than two years. Under LICO, the average duration declined slightly, from 2.7 years in 1993-to-1998 to 2.4 years in 2002-to-2007; under LIM, it stayed at about 2.5 years.

The results across groups of people and communities are more interesting. Table 5.7 suggests that lone parents and unattached non-elderly people were the two groups that had longer durations of low income. In the six-year period from 1993 to 1998, their average lengths were, respectively, 4.5 and 4.3 years under LICO and 4.3 and 3.8 years under LIM. By the latest six-year period, from 2002 to 2007, these declined to 3.6 and 2.8 years under LICO, and 3.9 and 3.6 years under LIM.

Across provinces, residents of Quebec appeared to have a longer duration of low income in the 1990s and the early 2000s, but their situation improved over time. These findings are consistent with those described in the previous sections, which showed that Quebecers had a strong persistence of low income in the 1990s and that the persistence declined thereafter. In British Columbia, the duration of low income increased slightly over time, but the level was no higher than that in several other provinces. In Ontario, the average duration increased slightly over time but it was generally below the national average. However, in the Atlantic provinces, except Prince Edward Island, low-income spells typically lasted longer than in the rest of the country, particularly when LIM was used. For example, under LIM, the average duration of low-income spells in Newfoundland and Labrador, Nova Scotia, and New Brunswick were 3.0, 3.0 and 3.2 years in the 2002 to 2007 period, the highest in the country.

Between communities, again, we found that people in Montréal and Vancouver had longer spells of low income. The difference between them was that the duration declined over time for those in Montréal, while the duration of low income for those in Vancouver increased. The duration of low income in Toronto was generally below the national average in the 1993 to 1998 period, but over time, it approached or surpassed the national average by the 2002 to 2007 period. Surprisingly, residents from the city of Winnipeg had a long duration of low income under LICO and sometimes relatively high durations even under LIM, and although the situation improved over time, progress seemed slow. The duration of low income was also relatively long in Ottawa–Gatineau before 2000, but has declined since then.

55. Comparisons for the same group over time may be problematic when the economic circumstances are different between periods, for example, if a recession occurs in one period while expansion occurs in the other. In the former, a low-income spell can last longer while in the latter, it can be shorter.

Table 5.7 Average length of low-income spells (years)

	LICO				LIM				MBM
	1993 to 1998	1996 to 2001	1999 to 2004	2002 to 2007	1993 to 1998	1996 to 2001	1999 to 2004	2002 to 2007	2002 to 2007
Overall	2.7	2.6	2.4	2.4	2.5	2.5	2.5	2.5	2.3
Groups									
Children	2.9	2.7	2.4	2.4	2.8	2.8	2.7	2.8	2.4
Seniors	2.9	3.1	2.6	2.8	1.9	2.4	2.5	2.7	1.5
Lone-parents	4.5	4.6	3.9	3.6	4.3	4.3	3.8	3.9	3.6
Unattached non-elderly	4.3	3.5	3.3	2.8	3.8	3.9	3.4	3.6	2.9
Recent immigrants	3.5	2.7	2.6	2.3	3.1	2.3	2.9	2.4	2.3
Off-reserve Aboriginal people	2.9	2.4	2.4	2.2	2.8	2.7	2.6	2.6	2.5
Activity limited	..	..	3.4	3.4	..	..	3.5	3.4	2.9
Province									
Newfoundland and Labrador	2.9	2.9	2.7	2.4	2.9	3.2	3.2	3.0	2.8
Prince Edward Island	1.9	2.1	2.2	2.0	2.2	2.4	2.7	2.3	2.2
Nova Scotia	2.9	2.5	2.6	2.4	3.0	2.8	3.1	3.0	2.5
New Brunswick	2.6	2.6	2.3	2.8	2.9	2.9	3.0	3.2	2.8
Quebec	3.3	3.0	2.5	2.5	3.0	2.7	2.6	2.6	2.2
Ontario	2.3	2.4	2.3	2.3	2.2	2.3	2.3	2.5	2.2

Table 5.7 Average length of low-income spells (years) (continued)

	LICO				LIM				MBM
	1993 to 1998	1996 to 2001	1999 to 2004	2002 to 2007	1993 to 1998	1996 to 2001	1999 to 2004	2002 to 2007	2002 to 2007
Manitoba	2.9	2.7	2.4	2.7	2.7	2.9	2.7	2.7	2.5
Saskatchewan	2.4	2.2	2.3	2.0	2.4	2.4	2.7	2.5	2.0
Alberta	2.5	2.2	2.5	2.0	2.3	2.4	2.5	2.1	1.9
British Columbia	2.5	2.5	2.3	2.7	2.2	2.5	2.4	2.7	2.5
Communities									
Montréal	3.8	3.3	2.4	2.6	3.3	2.7	2.3	2.5	2.2
Ottawa--Gatineau	3.0	3.3	1.8	2.4	2.2	3.2	1.7	2.8	2.5
Toronto	2.2	2.5	2.4	2.5	2.0	2.2	2.3	2.5	2.3
Winnipeg	3.2	3.0	2.7	2.9	2.7	2.6	2.7	2.6	2.5
Calgary	2.4	2.5	2.7	2.2	2.0	2.4	2.8	2.2	1.8
Edmonton	2.9	2.3	2.9	2.0	2.4	2.4	2.8	2.1	2.1
Vancouver	2.9	2.8	2.4	3.1	2.3	2.5	2.2	2.9	2.8
Other CMAs/CAs	2.6	2.6	2.6	2.4	2.5	2.6	2.9	2.6	2.3
Outside CMAs/CAs	2.3	2.0	2.1	1.9	2.5	2.5	2.6	2.7	2.2

.. not available for a specific reference period

CMA, census metropolitan area; CA, census agglomeration

Source: Survey of Labour and Income Dynamics (1993 to 2007)

Summary

Looked at from the year-to-year perspective, there is a long-term declining trend in the low-income entry rate under all three thresholds and an increasing trend in Canadians' resistance to low-income, though the recent recession lead to an increase in the entry rate and a decrease in the resistance.

The six-year panel data allows us to examine low-income transitions over a longer time span. The data suggest that a significant proportion of low income is of a transitory nature in Canada. One-third of those who fell into low income escaped in the next year. Still, over 20% of Canadians experienced low income at some time in a six-year period, although very few of them experienced low income for all six years. Nevertheless, several groups of people experienced low income more persistently than others. The most noticeable of these were lone parents and unattached non-elderly people and, to a lesser extent, people with activity limitations. Even though their persistence in low income dropped, they were the groups most likely to be in low income, and once in low income, they would stay the longest.

The persistence of low income dropped considerably in Alberta and Quebec, as well as in the major cities in these two provinces in recent years. In Alberta, in general, and in Edmonton and Calgary, specifically, persistent low income became rare. But the situation deteriorated in British Columbia, although the duration of low income did not appear to be particularly long, while in Ontario and in Toronto in particular, although low income persistence was generally at or below the national average, there was evidence to suggest that the situation deteriorated over time. Relatively long spells of low income were found in Newfoundland and Labrador, Nova Scotia and New Brunswick as well as in the city of Winnipeg.

Appendix

Methodology and data

Low income and poverty: Some conceptual issues

This report employs three low-income lines, the after-tax low-income cut-off (LICOs) and the after-tax low-income measure (LIM) developed by Statistics Canada as well as the market basket measure (MBM) developed by Human Resources and Skills Development Canada (HRSDC). The report also uses three indexes (the incidence, gap ratio and severity) to examine low income in Canada. It is not a report on poverty. As a statement by former chief statistician Ivan Fellegi makes it clear, "poverty is intrinsically a question of social consensus" and the determination of poverty criterion ultimately "involves value judgments" and, as such, it is not the role of Statistics Canada to define and measure poverty.[56] Instead, Statistics Canada seeks to assist policy development and public discourse on poverty by providing low-income thresholds and low-income statistics, based on scientific principles and international best practices.

Scientific principles and international best practices indicate that low income and poverty are not the same. In the scientific community, poverty has been conceived and measured differently[57]. But low income and poverty are seldom treated as identical concepts. Peter Townsend (Rio Group, 2006) approaches poverty from a social exclusion perspective. He wrote that the "determination of a poverty line cannot be based on an arbitrary selection of a low level of income" and it is not "enough to describe poverty as a condition applying to those whose disposable income is low relative to that of others." The 1998 Nobel laureate of economics, Professor Amartya Sen views poverty from the capability approach. He says that poverty "must be seen as the deprivation of basic capabilities rather than merely as lowness of income."[58]

One of the fundamental axioms on poverty is the focus axiom. It states that a poverty index should be independent of the non-poor population. The axiom implies that poverty measures should be about the 'poor' only. Many low-income conceptions and measurements, Statistics Canada's low-income lines included, violate the focus axiom. As shall be seen later, the thresholds of LICO are determined by the average spending on food, clothing and shelter of all Canadian households, not a subset of these households; the thresholds of LIM are based on the median of the income distribution of the whole population, while the baskets of the MBM represents a standard of consumption that is close to median standards of expenditure for food, clothing and footwear and shelter and somewhat below the median standard for other categories of expenditure. Hence, low income statistics under LICO, LIM and MBM are not independent of the incomes or expenditures of the non low income population. Therefore, if one accepts the focus axiom as a scientific principle in poverty measurement, one would have to distinguish low income from poverty.

But nobody would deny that poverty and low income are closely related, although answers to the question of how they are related differ. Townsend and Sen appear to suggest that low

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56. Fellegi (1997).
57. There are different conceptions of poverty, there are the "welfarist" and capability approaches, and there are the subsistence, basic needs, and social exclusion conceptions of poverty. For a reference, see Duclos and Araar (2006).
58. Sen (1979).

income is one aspect of poverty, so one cannot rely on low income alone to fully understand poverty. This is also consistent with authors who view poverty as a multi-faceted, multi-dimensional phenomenon in which income is a key dimension and the relative lack of income is a key facet of poverty.[59] In contrast, the 'welfarist' approach tends to measure poverty based on level of 'utility' in the context of optimal consumer choices. Here income enters into the decision-making process through a budget constraint. A person is in poverty if he or she fails to attain some normative level of utility. The key element under the welfarist approach to defining poverty is the lack of command over commodities (Duclos and Araar, 2006), and low income is one of the determinants of poverty. If a person's income is low, he or she would be unable to acquire a sufficient amount of commodities to attain the non-poor level of utility.

Since we do not have a definition of poverty in Canada, we would not be able to explicitly and precisely link our low-income measures to poverty. But some links are conceivable. For example, LICO identifies a family as in low income if it spends a substantially higher proportion of its income on life's essentials, and is thus likely to live in "straitened circumstance". If one treats this straitened circumstance as a state of relative deprivation, then a person who falls in low income would be somebody who is at risk to live in relative deprivation. LIM identifies a household (and its members) as in low income if its income is below half of the median adjusted income. This is an internationally accepted standard across developed countries. A person who falls into low income under LIM would be someone who is likely to have difficulties to fully participate in the society. Thus the LIM conception seems to have a link with the social exclusion definition of poverty.[60]

In practice, both Statistics Canada and HRSDC explicitly state that their low-income thresholds are not designed to measure poverty or to make any explicit judgments about what in Canada is a minimally acceptable level of income. Rather, low-income statistics should be used as a tool to broadly characterize groups of Canadians who are facing a high risk of poverty. More importantly, the statistics have been employed to track the changes in these groups over time, and since their inceptions, low-income thresholds have been used to identify low-income problems associated with, for example, the elderly, single parents, and children. In all these cases, government programs have been developed to help low-income Canadians and have had impacts on them.[61]

This report is based on the understanding that poverty and low income are closely related and yet are not the same. This view is consistent with experts' consensus and international best practices. At the minimum, the low-income measures are useful tools to help us to understand poverty in Canada in lieu of knowledge on what constitutes poverty and how it should be measured.

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59. For example, Asselin (2009) lists ten dimensions with income being the first in the list.
60. For relationship between the MBM thresholds and poverty, see Michaud, Cotton and Bishop (2004).
61. It is, however, important to recognize that government transfers, while significant and important to the families that receive them, have in general a much smaller impact on the distribution of incomes than do labour markets and financial markets. For this reason, caution is warranted in interpreting low-income statistics as an evaluation of government programs: much more careful analysis is required for such program evaluations.

Low-income lines or thresholds in Canada

As in poverty studies, there are two issues to resolve for low-income analyses: the identification issue and the aggregation issue. Identification tells us who is in low income and who is not, while aggregation tells us how many people are in low income, how far away they are from a given threshold and so on. Let's start with the low-income lines.

This report makes use of three low-income thresholds: LICO and LIM of Statistics Canada and MBM of HRSDC.[62] LICO is the oldest and the most widely recognized line. It is uniquely Canadian, not in use elsewhere in the world. LICO has been strongly criticized because of several methodological shortcomings (Wolfson and Evans, 1989) but it remains popular in practice. The current LICO thresholds are based on the 1992 consumption pattern of Canadian households. However, they are updated annually using the Consumer Price Index (CPI) to keep their real values.

More recently, HRSDC developed the MBM and began releasing results in 2000. The MBM is updated annually for price changes in the basket, and the basket is periodically rebased. The current MBM thresholds are based on a basket designed to meet the modest needs of Canadians, given the 2008 standard of living.[63] The main strengths of the MBM are that it provides a basket approach to measuring low income and it is sensitive to regional variations in the costs of living.[64] The measure is easy to communicate in the sense of comparing incomes with the cost of a basket of goods and services. But the details of goods and services in the basket are complicated. Numerous assumptions and experts' judgments need to be applied in deciding the items and their amounts. It is also very costly to rebase the basket and to calculate the thresholds.

The LIM line was introduced in the early 1990s based on the 1989 Wolfson and Evans report.[65] Its threshold is calculated as half of the median of the contemporary income distribution. In this sense, LIM is rebased every year to reflect annual changes in the standard of living. The methodology has gained currency during the last few decades among academic researchers and government organizations in low-income measurement and international comparisons. It is straightforward to calculate, easy to communicate, and all of its underlying assumptions are highly transparent.

However, an oft heard criticism to the LIM is that it is a pure inequality measure. Our view is that, as other low-income measures, it is closely related to inequality, but it does not measure inequality. First, by definition, an income inequality measure gauges the disparities of income of a society among all its members, while the low-income rate under LIM tells the proportion of people whose incomes are below half of the median adjusted income. The gap ratio tells us how far from the threshold a low-income person's income is, while the severity index tells how unequally income is distributed among the low-income people (but not among all people in the population, which is always the base for inequality measures).

Second, low income under LIM behaves differently from inequality measures. In measuring inequality, the most important principle an index must satisfy is the Pigou-Dalton transfer

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62. For details and technical descriptions of these lines, see Statistics Canada (2009), Murphy et al. (2010) and HRSDC (2009).
63. The shelter component of the 2008 MBM basket is currently under review by Human Resources and Skills Development Canada.
64. Strong price variations are able to affect the MBM incidence estimates. For example, if median house prices were to rise sharply, this would tend to increase the measured incidence of low income regardless of the actual housing costs paid by low-income individuals.
65. The LIM methodology was updated in 2010 to better reflect international developments (Murphy et al, 2010).

principle. In the strong form of the principle, it states that when an amount of income is transferred from a rich person to a poor person while maintaining their income ranks, the inequality measure should decrease. In the weak form of the principle, the inequality index should not increase. The incidence of low income under LIM can easily violate the strong form. For example, when the amount transferred is not large enough to lift the recipient out of low income. On the other hand, if the transfer happens to reach a person in the middle of the distribution such that the income rank is not altered but the median is made higher than before, low income rate would increase under LIM because the threshold becomes higher.

Third, operationally, inequality measurement is a one-step exercise in which incomes from the top of the distribution play the same role as incomes from the bottom. But low income measurement is a two-step practice. Under LIM, top incomes only affect the thresholds, while bottom incomes affect both the low-income thresholds and low-income indexes. Furthermore, since the median is not sensitive to the extremes at the high and low ends, low income indexes under LIM are not as sensitive to top incomes as inequality indexes.[66] Consider a simple case of two societies. The income of the richest person in one society is ten times as high as that of the richest person from the other, but all other aspects of the two distributions are the same. It is clear that inequality measures of the two societies will be different, but their low income measures under the current LIM configuration would be identical.

A related criticism is that low income will always be with us under LIM. Wolfson and Evans (1989) answered this question with a simple example. Figure A1 may help further to counter the criticism. Suppose the top graph of the figure describes the income distribution before certain transfers are made, while the bottom graph represents a situation after the transfers. The transfers may be designed such that the median is preserved, and hence the LIM thresholds (indicated by the vertical lines with an arrow) remain unchanged. It can be seen that low-income incidence, gap ratio and severity become zero in the bottom graph. Therefore, low income need not to be always with us under LIM.[67]

There are several similarities and differences between the three lines that will affect their interpretation. A major similarity is that all three lines set a standard that is based on the concepts of social exclusion and the ability to participate in Canadian society. Other thresholds set a lower standard and are probably more appropriate for concepts of survival or serious hardship.[68] All of the three lines imply that individuals living in households and families below the threshold are in some sense deprived relative to others, but each line tells a different story about what it means to be deprived.

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66. However, if one uses the mean income as basis for the threshold, as some countries do, then income from the top plays an equally important role in affecting the thresholds as those from the bottom do.
67. The example also helps to show that low income and inequality measure different things. After the transfers, low income would be erased, but inequality still exists.
68. Chris Sarlo, for example, has defined a basic need poverty line as the cost of a list of basic needs required for long-term physical well-being (Sarlo, 2001).

Figure A1. Income distributions before and after a transfer

Probability

Income

Probability
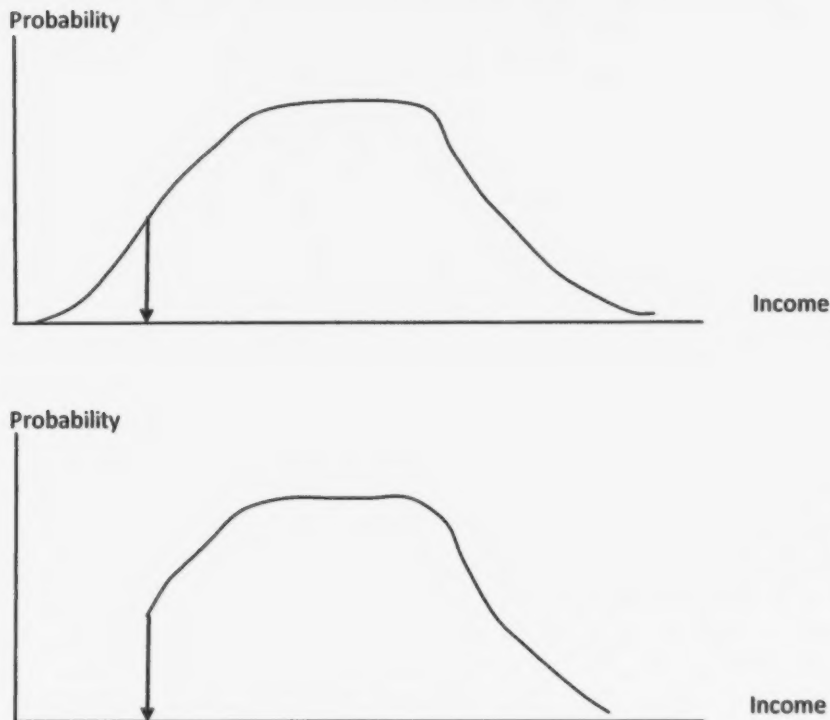
Income

The LICO implies that a person is deprived if he or she lives in a family that has to spend significantly more of its income on the necessities of life than the average family, and therefore has little discretionary income with which to participate fully in society. The LIM considers one to be deprived if his or her household income is less than half of the income of the median household. With much less income than the mainstream makes, a person would have difficulty participating fully in the society. The MBM considers as deprived individuals whose families lack the disposable income to purchase the goods and services of the 'market basket' that represents a modest yet decent standard of living (HRSDC, 2009).

The second similarity between the lines is that, regardless of how the thresholds were determined, they are all compared with resources defined in terms of income. Poverty and deprivation can be studied by examining what people actually consume or by examining their income—which determines their capacity to consume. Income information is more broadly available than consumption data in Canada, and so for practical reasons the development of indicators of deprivation has tended to use income.

While all three lines use income available for discretionary consumption there are some differences. The LICO and LIM make use of Statistics Canada's standard income concepts such as market income, total income and after-tax income. MBM starts with the same concept

of after-tax income but goes further to deduct some other non-discretionary spending to end up with its own disposable income concept.[69]

All three lines take economies of scale into account through the use of equivalence scales, but they account for these economies differently. Economies of scale in consumption and resource-sharing within the family or household are important factors in determining the low-income thresholds. Larger families do not need the same level of per capita income to be as well off as smaller families because of economies of scale. However, the units of resource-sharing of the three lines are different, and each line assumes different equivalence scales. The unit of sharing of LICO and MBM is the economic family, while the unit of sharing under LIM, consistent with international practice, is the household. Practically, there is little difference in the definition, as 95% of households contain only one economic family and only 2.5% of individuals live in secondary economic families (Murphy et al., 2010).

Both the LIM and the MBM adjust income using the square root of the number of members living together; the square root of the economic family size in the case of the MBM and the square root of household size in the case of the LIM, while under LICO, the equivalence scales were estimated and implicitly built into the thresholds. However, the assumption of sharing of resources within the economic family or household under the three lines is identical: each member shares equally, implying that if the family or household falls in low income, each member is also in low income.

The three lines can be also compared in terms of how each threshold is updated. There are two fundamentally different ways—rebasing and indexing.[70] Rebasing refers to the process of making judgments as to the relative level of income required to participate fully in society at a given point in time, while indexing refers to a simple adjustment of the dollar amount of the thresholds to account for inflation. Every low-income line, as such, represents a standard based on relative judgments that have been set at a given point in time. When this standard is not rebased to reflect current living conditions (i.e., making new relative judgments), and the thresholds are merely indexed to the CPI, it allows a comparison of Canadians' current situation to the distribution of well-being in an earlier time. Of course, at some point the relevance of this comparison becomes questionable as time passes. For example, it makes little sense to determine the low-income status using thresholds based on standards of living reached centuries ago, even though the thresholds are indexed to account for inflation.

The current LICO thresholds are based on the 1992 consumption patterns in Canada. Each year the LICOs are adjusted to account for increases in the cost of living using the CPI, but since 1992 Statistics Canada has not rebased the cut-offs themselves.[71] As such, the real value of the LICO thresholds represents the well-being of Canadians living in the early 1990s, so they

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69. Market basket measure family disposable income is the sum remaining after deducting from total family income the following: total income taxes paid; the personal portion of payroll taxes; other mandatory payroll deductions such as contributions to employer-sponsored pension plans, supplementary health plans and union dues; child support and alimony payments made to another family; out-of-pocket spending on child care; and non-insured but medically-prescribed health-related expenses such as dental and vision care, prescription drugs and aids for people with disabilities. Generally, the average disposable income for the market basket measure is about 10% lower than average after-tax income used by LICO and LIM.

70. These are also sometimes referred to as relative updating and absolute updating. We chose not to use that terminology as it is sometimes confused with the absolute or relative nature of the actual basket or threshold.
71. The low-income cut-offs have been previously rebased in 1969, 1978, 1986 and 1992. Statistics Canada is not planning an update to the low-income cut-offs chiefly because the changes to the Survey of Household Spending make it impossible to replicate the methodology.

are considered 'fixed' thresholds.[72] The first MBM basket was established in 2000. The basket was recently revised relative to the 2008 standard of living. HRSDC plans to rebase the MBM basket periodically by examining the contents of the basket and making appropriate changes. Each year the basket is indexed through a process of re-costing the basket at current prices, but the basket itself does not change. But different from both LICO and MBM, as mentioned before, the LIM thresholds are rebased each year to reflect changes in the income distribution and as such always based on a current standard.

There are similarities and differences between the three lines in terms of geographic reference. Every low-income line represents a living standard that has been set for a given geographic place. While all three lines can be considered national lines, the low-income lines vary in their treatment of geographic differences across Canada. The LIM is truly a national line, as no attempt is made to adjust the levels of its thresholds for different regions. Each Canadian is compared with the same national threshold for a given household size. It is the most analytically transparent line, as it is clear that the same standard is applied equally to all Canadians. While this transparency is desirable, the national LIM does not take into account price differentials across Canada.

The LICO on the other hand is a mix of national and sub-national calculations. The overall average proportion of spending on necessities is calculated at the national level while the actual thresholds are calculated for five different areas to reflect different consumption patterns between these areas. Thus the LICO for large cities would apply to any city over 500,000, regardless of geographic location. That is, the same line is used for Montreal, Toronto and Vancouver. The MBM varies geographically, as well, but the determination is more explicitly designed to take into account the price differentials across Canada. The MBM thresholds vary with the cost of the goods and services in the basket, not only between community sizes, but between communities of the same size in different provinces. Currently, the national basket of MBM is priced for 49 different geographic areas. While taking price variability into account, there can still be issues involved. For example all rural areas in a province have the same MBM threshold while some of them are decidedly closer to city centers than others.

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72. This, in a way, is similar to Orshansky's line in the United States, which has not been rebased for more than 50 years.

Why multiple lines and indexes?

Requests persist for a single index under a single low income line so that simple, straightforward answers to questions such as, who are poor, how many are poor and how poor they are, can be obtained. On the surface, low income or poverty appears to be a simple binary event: a person is either poor or not poor; a person is either in low income or not. But the problem is that there is no universally accepted standard for determining poverty or low income and low-income lines or thresholds will always contain a certain degree of arbitrariness.[73] Given these, one is practically "forced to use more than one criteria" to obtain robust results.[74] Consequently, following international best practices, we employ multiple low-income lines (LICO, LIM and MBM) and indexes (the incidence, the gap ratio and the severity) in this study.

The arbitrariness is embedded in all three low-income lines in Canada. The LIM methodology chooses 50% of the median-adjusted income to determine the low-income thresholds. LICO determines its thresholds as the income of households that spent 20% of their income above the national average on food, clothing and shelter. There is no 'correct' answer as to why 50% was used; why not 55% or 45% in the case of LIM? Why 20% and not 19% or 21% in LICO? The arbitrary nature of the low-income lines implies that they are essentially tools to answer hypothetical questions, such as what would be the low-income rate if half of the median income were chosen as the criterion? Without a 'correct' definition of low income, several low-income lines would be preferred over a single line to better understand poverty through low-income statistics. At the very least, more robust results are possible when different low income lines are employed.

With any low-income line, several low-income indexes can be obtained. The most popular one is the low-income rate, also known as low-income incidence or headcount. It tells us what proportion of the population lives under a given threshold. This index is simple and easy to understand. But it is not the only useful index, nor does it provide complete information about low income. On the contrary, it has been criticized because of its 'all or nothing' character.[75] In the extreme case, it means somebody whose income was one dollar below the line was identified as being in low income and somebody else whose income was one dollar higher was not. Such a scenario makes the headcount index undesirable. Best practice calls for the low-income incidence to be accompanied by other measures.

On the other hand, the low-income gap indexes tell us how far the income of a low-income person is from the relevant threshold. One of them is the Sen index. It measures the difference between incomes of the low income population and the thresholds they face. A more popular index calculates the average gap ratio among the whole population. Low-income severity indices are also available. One of them is the average of the squares of the gap ratio. This severity index indicates how 'low income' is distributed among the low-income population. An example may illustrate why higher-order indexes are useful. Consider a society that consists of ten people. The low-income line is $15,000. Three people have income below the line: $14,500, $10,000, and $5,000, respectively. The incidence is then 30%. Suppose the society transfers $1,000 to the three people. If the total is transferred equally among them, their well-being would all be improved. While the headcount would stay the same as before, the gap ratios would be able to capture the improvement.

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73. Atkinson (1983).
74. Sen (1979).
75. Saunders (2004).

To see the usefulness of the severity index, consider another society that has the same population size and low-income lines as above but the three people have incomes of $14,000, $10,000 and $5,500, respectively. If we rely on the low-income rate and gap ratio indices only, we may conclude that the two societies have equal low income. But because the income of the person from the very bottom of the second society is better-off than his/her counterpart in the first society, one can say that low income in the second society is less severe.[76]

Although multiple lines and multiple indexes help us obtain robust results, they are certainly accompanied by challenges. For example, multiple lines result in different incidences of low income. The tempting question is then which estimate is 'correct'? The simple answer is that they are all correct in their own contexts, because different lines answer different hypothetical questions. They measure low income from different angles and their interpretations are different. Another challenging question is, because of the arbitrariness inherent in the low-income lines, what is the usefulness of low-income statistics? The answer is that they can be used to study trends in low income as we did in the current report. A low-income line may lead one to overstate or understate the level of low income, but those biases do not invalidate low income comparisons over time if the line is rebased regularly and the underlying standard of living does not change dramatically. That is, if a given line overstates or understates low income in one year, it tends to do the same in the next year, producing a valid trend in low income over time, even though the estimated levels in low income are biased.

Figure A2. Low income rates under previous (2000) and current (2008) MBM thresholds
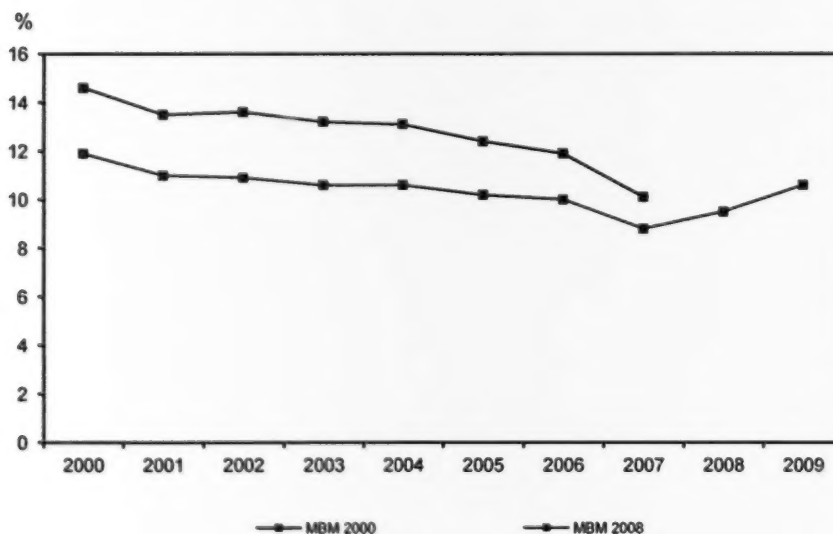
Source: Survey of Labour and Income Dynamics (2000 to 2009), Statistics Canada.

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76. For a complete list of low income indexes, see, for example, Duclos and Araar (2006).

The above argument can be illustrated by the estimated low-income rates under the 2000 and the 2008 MBM lines for the period from 2000 to 2009 (2007 under MBM 2000). For each year, the top curve in Figure A2 shows what the low-income rates would have been if the old MBM basket (MBM 2000) were to be used, while the bottom curve indicates the estimated low-income rates under the current 2008 MBM basket (MBM 2008). Apparently, the estimated levels of the low-income rates (and hence the number of people counted as in low income) under the two MBM lines were quite different, we do not know which level is correct and we do not know the magnitudes of the biases contained in the two groups of estimates. But, no matter which MBM thresholds are employed, one would observe the same downward trend in low-income rate from 2000 to 2007.

The arbitrariness of the low-income thresholds has consequences for the interpretation of low-income statistics. Many observers are interested in the extent of low income in Canada. There is no definitive answer—only hypothetical ones—to the question of how many poor people there are in Canada. With three different lines, this report provides three estimates of the number of people with low incomes. In 2009, the highest estimate of the number of Canadians with low incomes was 4.4 million, according to LIM, while LICO and MBM counted 3.2 and 3.5 million people, respectively. In the year 2000, LICO and LIM produced the highest estimates of low income, at 3.8 million people, while the MBM counted 3.6 million. Still earlier, in 1996 it was LICO that had the highest estimate, at 4.4 million, a full 725,000 higher than the LIM.

These estimates of the number of people in low income are difficult to interpret and the relative ranking of the measures means little on its own. The estimates include certain individuals who one would likely not consider poor even though they have low income. Conversely, people may have income above the threshold but, for example, because of high spending on health care due to sickness, may have insufficient income to meet their basic needs. The issue is not that the LIM is finding more low-income Canadians than the LICO in 2009, nor is the issue that the LICO is finding more low-income Canadians than the LIM in 1996. Each line has its own metrics and should be looked at over time relative to itself. Where these trends over time differ between the lines, we can examine multiple lines and indexes to gain a clearer picture of the underlying phenomena.

Data sources

Statistics Canada has several data sources that can be used for analysis of low income. Given time and resource constraints, the current report is based only on data from the Survey of Consumer Finances (SCF) and Survey of Labour and Income Dynamics (SLID).[77]

The SCF was an annual supplement to the April Labour Force Survey (LFS) until 1997. The samples for SLID are also selected from the LFS frame. The targets of the population of the two surveys are the same: all individuals in Canada, with the exclusions of residents of the Yukon, the Northwest Territories and Nunavut, residents of institutions and persons living on Indian reserves.[78] The SCF is conducted to provide data on cross-sectional income for the Canadian population. The SLID serves the same purpose, in addition to providing longitudinal income data.[79] We have employed SCF for the period from 1976 to 1995 and SLID for the period from 1996 to 2009[80]. The only exception was that we used SLID from 1993 for studying the dynamics of low income. While we examined the evolution of low income for the 34-year period from 1976 to 2009, the focus was on more recent years, particularly from 2000 to 2009, in which some key variables for identifying vulnerable groups of individuals were available.

For cross-sectional, Canada-level analysis, we took all individuals from the surveys into account; no individual was excluded. The sample sizes varied from year to year. But, with the exception of 1976, 1978, 1980 and 1983, the sample sizes were large, ranging from 64,167 persons in 2008 to 115,966 in 1990. Even during the years in which the samples were relatively small, they were still reasonably large at the country level, varying from 38,315 in 1976 to 42,322 in 1980.

For analysis of low-income dynamics, we relied on balanced panels with various lengths, from two to six years. At the national level, the numbers of observations were 29,152 for the 1993-to-1998 panel, 29,527 for the 1996-to-2001 panel, 25,602 for the 1999-to-2004 panel, and 23,735 for the 2002-to-2007 panel. For provinces and cities, the overall sample sizes were also reasonable. For example, in 2008, although the total sample size was relatively small, the number of observations in the provinces ranged from 1,785 in Prince Edward Island to 18,509 in Ontario. As well, for the seven largest cities, the number of observations varied from 1,412 in Calgary to 3,415 in Toronto. However, when individuals within provinces or cities were classified by groups, the sample sizes were not large, particularly in smaller provinces and cities. As a result, the report excluded groups whenever they had less than 100 observations.

Finally, it should be noted that data for the low-income thresholds were somewhat different. The LIM thresholds were constructed using income and demographic data from SCF and SLID. Hence, low-income statistics under LIM as well as the LIM thresholds are estimated from the same data source. The LICO thresholds were constructed with data from the 1992 Family Expenditure Survey (FAMEX), with the thresholds for a particular year being adjusted by the

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77. We plan to explore data on low income from the Longitudinal Administrative Databank to assess the dynamics of low income among groups of individuals in more detailed regions over a longer time span and data from the censuses to examine low income in small areas.

78. These exclusions amount to less than 3% of the total population.

79. For detailed information on the two surveys, see Cotton (2000) and references therein.

80. Since 2007 standard publications on low income from SLID have used a combined and re-weighted SCF/SLID sample from 1993-1997. For this reason estimates provided in this report will not exactly match published estimates for those years.

CPI.[81] The MBM thresholds, on the other hand, were constructed using price data collected by Statistics Canada separately, while the corresponding disposable income, against which the MBM thresholds were compared for low income identification, was based on data from SLID.[82]

Table A1. The 2009 after-tax LICO thresholds (1992 base)

Family size	Rural area	Urban area by population size			
		Under 30,000	30,000 to 99,999	100,000 - 499,999	500,000 or more
1 person	12,050	13,791	15,384	15,579	18,421
2 persons	14,666	16,785	18,725	18,960	22,420
3 persons	18,263	20,900	23,316	23,610	27,918
4 persons	22,783	26,075	29,089	29,455	34,829
5 persons	25,944	29,692	33,124	33,541	39,660
6 persons	28,773	32,929	36,736	37,198	43,984
7 or more	31,602	36,167	40,346	40,854	48,308

Source: CANSIM table 202-0801, Statistics Canada.

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81. Zhang (2010), among others, illustrates how the LICO thresholds were estimated for 1992 and how they were adjusted in other years.
82. See Tables A1 through A3 for the thresholds under the three lines in 2009.

Table A2. The 2009 after-tax LIM thresholds

Household size	Thresholds
1 person	18,680
2 persons	26,418
3 persons	32,355
4 persons	37,360
5 persons	41,770
6 persons	45,756
7 persons	49,423
8 persons	52,835
9 persons	56,040
10 persons	59,071

Source: CANSIM table 202-0808, Statistics Canada.

Table A3. The 2009 MBM thresholds for reference family (2008 base)

Community	Thresholds	Community	Thresholds
Newfoundland and Labrador		**Prince Edward Island**	
Rural	31,137	Rural	30,391
Population under 30,000	32,382	Population under 30,000	32,353
St. John's	31,665	Charlottetown	31,470
Nova Scotia		**New Brunswick**	
Rural	30,850	Rural	30,638
Population under 30,000	32,862	Population under 30,000	32,005
Population 30,000-99,999	30,567	Population 30,000-99,999	31,518
Halifax	31,815	Fredericton	31,752
Cape Breton	29,847	Saint John	30,512
		Moncton	30,425
Quebec		**Ontario**	
Rural	28,321	Rural	28,775
Population under 30,000	29,290	Population under 30,000	29,935
Population 30,000-99,999	27,874	Population 30,000-99,999	27,941
Population 100,000 to 499,999	28,597	Population 100,000 to 499,999	29,303
Quebec	28,946	Ottawa	31,412
Montreal	29,869	Hamilton/Burlington	29,252
		Toronto	32,503

Table A3. The 2009 MBM thresholds for reference family (2008 base) (continued)

Community	Thresholds	Community	Thresholds
Manitoba		**Saskatchewan**	
Rural	28,745	Rural	30,162
Population under 30,000	30,327	Population under 30,000	31,247
Brandon	28,884	Population 30,000-99,999	29,402
Winnipeg	29,333	Saskatoon	30,689
		Regina	29,778
Alberta		**British Columbia**	
Rural	30,602	Rural	29,374
Population under 30,000	32,551	Population under 30,000	30,602
Population 30,000-99,999	31,225	Population 30,000-99,999	28,748
Edmonton	31,498	Population 100,000 to 499,999	30,501
Calgary	32,783	Vancouver	31,414

Source: CANSIM table 202-0809, Statistics Canada.

Table A4.   95% Confidence interval estimates of low-income rates for at-risk groups in provinces, 2000 and 2009

	2000						2009					
	LICO		LIM		MBM		LICO		LIM		MBM	
	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound
Newfoundland and Labrador												
All persons	11.9	14.5	20.0	22.9	19.0	22.0	5.8	8.3	14.0	17.3	11.7	14.8
Children	14.9	20.9	26.1	33.0	25.1	31.9	5.8	12.9	16.5	25.3	15.0	23.7
Seniors	1.4	5.8	13.1	21.1	8.6	15.5	0.4	3.0	17.1	25.1	3.6	8.5
Lone-parents	36.9	52.0	56.0	70.2	51.6	66.1	7.5	20.9	38.5	56.1	37.2	54.8
Unattached non-elderly	34.3	51.8	27.4	43.0	38.9	56.4	25.9	48.3	30.4	52.9	36.5	59.4
Off-reserve aboriginal	F	F	F	F	F	F	5.4	15.3	13.2	25.7	11.8	24.5
Activity limited	14.3	21.1	26.5	34.6	23.9	31.9	8.2	14.5	18.1	25.6	13.0	20.0
Prince Edward Island												
All persons	7.7	10.4	14.1	17.3	12.9	16.2	3.6	6.0	10.2	13.8	7.3	10.3
Children	5.3	10.2	15.1	22.1	13.4	20.2	3.4	9.4	12.1	20.4	7.5	14.9
Seniors	2.7	9.1	9.6	17.3	4.9	12.2	0.4	4.0	7.0	14.7	5.0	12.3
Lone-parents	12.1	26.3	33.5	51.0	29.8	47.2	11.1	27.0	32.8	51.3	26.6	45.1
Unattached non-elderly	30.5	46.6	28.6	44.7	32.3	48.5	13.0	38.4	26.6	54.3	21.5	48.8
Activity limited	7.5	15.4	13.1	21.5	10.1	18.6	3.8	10.2	11.0	19.6	8.7	16.7
Nova Scotia												
All persons	10.6	12.7	14.7	17.0	13.1	15.3	6.9	9.2	15.5	18.4	11.7	14.4
Children	10.4	14.9	16.4	21.4	14.5	19.4	5.7	10.8	16.5	23.6	11.3	17.5
Seniors	3.7	7.8	13.9	20.0	5.9	10.1	1.7	5.1	16.0	22.6	6.2	11.1
Lone-parents	23.0	35.0	35.8	48.4	33.7	46.1	13.7	26.1	32.5	47.4	28.6	43.1
Unattached non-elderly	33.6	44.6	25.3	35.9	35.0	46.0	21.5	38.2	29.1	46.1	30.4	48.2
Off-reserve aboriginal	F	F	F	F	F	F	7.4	26.9	19.0	40.4	14.6	35.3
Activity limited	13.7	19.1	20.4	26.2	16.6	22.1	7.2	11.7	21.7	28.1	16.1	22.2

Table A4.   95% Confidence interval estimates of low-income rates for at-risk groups in provinces, 2000 and 2009 (continued)

	2000						2009					
	LICO		LIM		MBM		LICO		LIM		MBM	
	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound
New Brunswick												
All persons	8.3	10.1	13.7	15.9	12.7	14.8	5.7	7.7	13.3	16.0	10.0	12.5
Children	8.8	12.7	15.9	20.8	14.0	18.6	5.1	9.9	14.2	20.8	11.4	17.7
Seniors	1.9	4.9	9.6	15.0	5.3	9.9	0.5	2.3	12.5	18.5	3.0	6.5
Lone-parents	27.4	38.5	42.0	53.8	38.6	50.4	15.8	29.5	35.9	51.0	33.2	48.4
Unattached non-elderly	31.6	43.6	26.6	38.1	35.8	48.2	21.9	38.2	28.9	46.0	28.9	45.7
Off-reserve aboriginal	F	F	F	F	F	F	2.3	16.4	9.1	27.6	7.9	24.9
Activity limited	9.3	14.5	15.8	21.7	13.8	19.7	7.8	13.1	16.8	23.2	11.9	17.9
Quebec												
All persons	14.0	15.7	14.2	15.8	10.8	12.4	8.5	10.2	12.8	14.7	8.6	10.3
Children	14.2	18.0	16.1	19.8	12.0	15.4	6.0	9.5	10.7	14.8	7.2	10.6
Seniors	10.0	14.2	9.3	12.8	1.0	2.6	5.9	9.5	14.1	18.5	3.2	6.1
Lone-parents	33.7	42.1	36.1	44.5	31.8	40.1	14.4	22.1	24.1	32.6	17.0	25.0
Unattached non-elderly	35.9	42.8	26.7	32.9	29.4	36.0	24.7	35.1	26.0	36.4	24.2	34.3
Recent immigrants	27.9	47.6	22.2	41.4	17.8	36.3	14.5	33.6	26.6	47.7	15.8	34.9
Off-reserve aboriginal	11.8	22.6	12.5	22.9	8.7	18.1	15.0	30.6	19.1	34.5	12.1	27.5
Activity limited	23.2	29.1	22.2	27.6	16.3	21.7	13.4	17.9	20.0	24.8	12.0	16.2
Ontario												
All persons	10.2	11.4	9.6	10.6	9.3	10.4	9.3	10.9	12.3	13.8	9.7	11.2
Children	11.7	14.2	11.9	14.2	11.0	13.3	8.5	11.7	12.9	16.3	9.5	12.6
Seniors	4.8	7.5	3.8	5.6	2.4	4.6	3.1	5.6	7.2	10.3	2.3	4.5
Lone-parents	26.0	31.9	28.8	34.7	25.4	31.2	15.0	21.3	26.5	33.7	17.2	23.8
Unattached non-elderly	32.0	38.0	23.4	28.8	28.0	33.9	35.8	48.3	27.1	37.7	31.5	43.7

Table A4. 95% Confidence interval estimates of low-income rates for at-risk groups in provinces, 2000 and 2009 (continued)

	2000						2009					
	LICO		LIM		MBM		LICO		LIM		MBM	
	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound
Recent immigrants	20.1	29.6	15.1	23.4	16.4	25.5	10.9	21.0	13.1	22.7	9.3	18.1
Off-reserve aboriginal	8.4	15.9	9.3	16.9	8.5	15.8	6.8	15.6	16.7	28.0	7.3	16.0
Activity limited	12.2	15.3	11.7	14.5	9.7	12.6	12.5	16.3	18.1	22.1	12.8	16.6
Manitoba												
All persons	12.4	14.5	13.3	15.4	9.9	11.8	7.7	10.2	13.9	16.8	8.5	11.0
Children	14.6	19.2	19.0	23.9	12.9	17.2	6.6	11.6	18.8	25.6	9.0	14.2
Seniors	7.1	11.6	6.5	10.5	1.1	3.1	3.5	8.8	8.1	14.0	1.5	5.7
Lone-parents	36.3	48.2	41.9	53.9	34.8	46.6	15.8	28.1	43.0	57.0	18.2	30.1
Unattached non-elderly	32.5	43.0	17.9	27.0	23.3	33.1	17.6	36.9	16.4	35.2	17.8	37.0
Off-reserve aboriginal	21.1	33.5	23.8	36.5	16.6	27.9	8.4	18.6	19.1	32.0	11.8	22.6
Activity limited	13.3	19.0	13.3	18.7	8.1	12.8	8.9	15.3	12.9	19.5	9.5	15.9
Saskatchewan												
All persons	9.9	11.9	15.6	18.0	12.2	14.3	6.1	7.9	10.6	12.7	8.5	10.5
Children	11.0	15.3	19.9	24.9	14.9	19.5	7.6	11.9	12.7	17.7	10.9	15.8
Seniors	1.3	3.7	8.2	12.8	1.0	3.2	0.4	2.1	10.8	16.1	1.8	4.2
Lone-parents	30.6	42.4	42.6	54.4	37.3	49.1	23.3	35.4	38.0	50.8	30.9	43.7
Unattached non-elderly	32.3	43.2	28.0	39.3	31.4	42.3	15.5	30.0	18.8	34.0	20.3	35.8
Off-reserve aboriginal	17.7	30.3	24.6	38.0	19.0	31.7	14.2	26.4	18.0	30.8	19.1	32.6
Activity limited	9.2	14.6	13.9	19.4	10.5	16.0	6.6	11.0	12.0	17.0	8.6	13.3
Alberta												
All persons	10.1	12.0	9.4	11.2	10.1	11.9	6.7	8.7	8.1	10.0	8.9	11.0
Children	10.6	14.4	11.1	14.9	10.7	14.4	7.1	11.5	10.5	15.2	10.9	15.8
Seniors	1.1	3.7	1.1	3.3	1.0	3.1	0.8	3.0	1.3	3.7	0.6	2.5

Table A4. 95% Confidence interval estimates of low-income rates for at-risk groups in provinces, 2000 and 2009 (continued)

	2000						2009					
	LICO		LIM		MBM		LICO		LIM		MBM	
	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound
Lone-parents	23.1	34.7	22.1	33.0	24.3	36.3	9.8	18.7	17.8	28.5	18.1	29.2
Unattached non-elderly	32.0	41.0	19.0	26.8	27.8	36.5	15.3	30.5	14.6	28.9	18.6	34.0
Recent immigrants	9.7	28.2	12.9	32.5	10.5	28.7	7.8	23.3	9.3	24.9	7.0	22.2
Off-reserve aboriginal	11.7	24.9	10.3	21.8	13.3	26.6	1.5	12.3	4.6	15.7	3.1	14.1
Activity limited	12.1	17.6	10.4	15.2	11.5	16.6	5.7	10.0	8.1	12.7	7.6	12.2
British Columbia												
All persons	14.0	16.3	13.8	16.0	15.6	18.0	10.7	13.3	13.8	16.4	11.7	14.3
Children	11.9	16.5	13.5	18.1	15.9	20.8	9.1	14.8	14.7	21.0	10.9	16.9
Seniors	7.0	12.1	5.2	9.3	2.8	6.3	5.2	9.4	9.7	14.6	4.3	8.0
Lone-parents	23.6	33.7	28.0	38.2	29.6	39.9	9.1	20.5	19.1	31.7	12.3	23.9
Unattached non-elderly	33.6	43.1	23.3	31.8	31.7	41.1	20.8	36.0	22.2	37.6	20.4	35.6
Recent immigrants	22.1	36.4	18.6	32.7	18.1	32.1	16.2	33.1	16.6	33.5	16.8	33.5
Off-reserve aboriginal	16.8	32.4	22.4	38.0	24.2	40.4	11.6	23.8	16.6	30.4	13.3	26.5
Activity limited	17.4	23.8	17.2	23.5	17.5	23.9	11.4	17.2	15.5	21.5	11.9	17.8

F too unreliable to be published

Note: The confidence interval estimates allow us to test if the difference in low income rates between groups is statistically significant under the same threshold

For example, under LICO, the 95% confidence interval estimates of low income rates for Newfoundland and Labrador were (11.9, 14.5) and (5.8, 8.3) in 2000 and 2009. Hence under LICO, the low income rate declined for this province between the two years because the intervals do not overlap. On the other hand, the 95% confidence interval estimate of low income rate for PEI residents in 2009 was (3.6, 6.0) under LICO. This was lower than that for Newfoundland and Labrador residents, which is (5.8, 8.3). But the difference is marginally significant because the two intervals overlap each other slightly.

Source: Survey of Labour and Income Dynamics, 2000 and 2009, Statistics Canada.

Table A5.   95% Confidence interval estimates of low-income rates for at-risk groups in cities, 2000 and 2009

	2000						2009					
	LICO		LIM		MBM		LICO		LIM		MBM	
	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound
Montreal												
all people	18.0	21.4	14.3	17.4	11.9	14.8	11.4	14.8	13.2	16.8	9.9	13.2
Children	19.4	26.8	16.7	23.9	13.2	19.9	8.5	15.4	11.7	19.3	7.9	14.5
Seniors	14.6	23.2	7.0	13.7	0.5	3.9	9.0	16.8	10.9	19.1	3.8	9.6
Lone-parents	35.8	49.8	35.9	49.9	29.2	43.2	16.4	30.8	21.4	36.5	14.9	29.2
Unattached non-elderly	33.7	45.7	20.1	30.7	24.7	36.3	25.4	43.9	23.4	41.9	22.0	40.0
Activity limited	28.8	40.8	21.1	32.1	16.4	27.6	15.1	23.6	17.5	26.3	11.4	19.3
Ottawa-Gatineau												
all people	12.7	16.6	10.1	13.5	10.3	14.1	7.4	11.2	7.9	11.5	7.5	11.2
Children	9.8	17.2	8.6	15.7	8.8	16.1	5.4	13.1	6.2	13.9	6.1	14.2
Seniors	8.2	18.7	3.5	11.0	1.8	8.2	1.2	7.7	3.5	10.7	0.0	5.2
Lone-parents	19.8	36.0	18.5	34.5	20.1	36.3	F	F	F	F	F	F
Unattached non-elderly	31.4	47.8	17.3	30.9	25.2	41.6	21.7	50.2	11.5	36.4	15.5	42.3
Activity limited	15.4	25.9	13.1	23.1	10.3	19.6	9.7	19.0	9.8	18.9	9.4	18.8
Toronto												
all people	11.2	13.6	8.3	10.3	9.3	11.5	11.6	14.9	11.7	14.7	10.8	13.9
Children	14.7	20.1	11.5	16.3	12.2	17.2	10.2	17.0	10.9	17.8	9.5	16.0
Seniors	6.9	13.4	2.8	6.7	3.0	8.6	5.3	11.4	7.9	14.7	3.6	8.9
Lone-parents	24.3	36.3	19.5	30.5	22.8	34.6	8.0	21.0	12.6	27.3	8.0	21.0
Unattached non-elderly	22.5	33.8	15.5	25.6	20.6	31.7	36.2	61.3	16.2	36.5	28.2	53.6
Recent immigrants	17.2	28.5	11.4	21.3	13.1	23.9	11.1	24.2	10.3	22.4	8.4	19.7
Activity limited	10.8	17.9	6.6	12.4	6.9	13.1	14.4	23.1	16.5	25.0	13.8	22.4

Table A5.   95% Confidence interval estimates of low-income rates for at-risk groups in cities, 2000 and 2009 (continued)

| | 2000 | | | | | | 2009 | | | | | |
| | LICO | | LIM | | MBM | | LICO | | LIM | | MBM | |
	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound
Winnipeg												
all people	14.6	17.7	10.1	12.7	7.9	10.3	8.9	12.3	10.6	14.2	6.8	9.9
Children	15.7	22.6	12.6	19.0	8.3	13.8	8.2	15.6	11.9	20.4	5.2	11.4
Seniors	11.1	18.4	4.5	9.9	0.5	3.2	5.5	13.8	7.0	15.1	0.5	6.7
Lone-parents	39.2	54.7	37.6	53.1	26.9	41.7	20.8	38.2	41.2	59.5	13.3	28.2
Unattached non-elderly	36.4	49.3	16.6	27.6	23.4	35.4	F	F	F	F	F	F
Off-reserve aboriginal	22.6	40.3	15.6	32.2	11.3	26.1	6.7	20.4	15.0	32.0	6.9	20.6
Activity limited	17.9	26.3	12.3	19.7	7.9	14.6	9.3	17.8	9.1	17.1	7.3	15.3
Calgary												
all people	8.1	11.8	5.5	8.6	7.1	10.6	6.6	10.6	5.4	9.1	6.3	10.2
Children	5.5	11.8	4.8	10.8	5.7	12.5	3.1	12.3	3.3	12.6	3.6	13.3
Seniors	0.4	6.2	0.0	5.2	0.0	3.2	1.1	7.4	0.4	5.2	0.2	5.3
Unattached non-elderly	26.5	43.7	10.4	24.5	19.1	35.4	F	F	F	F	F	F
Activity limited	8.0	17.7	5.3	13.4	6.6	15.8	5.3	15.2	5.0	14.8	3.8	12.8
Edmonton												
all people	11.8	15.6	8.5	11.7	8.5	11.7	8.4	12.6	8.2	12.0	9.8	14.2
Children	15.2	24.1	11.4	19.5	10.3	17.9	10.7	20.2	12.5	22.5	14.0	24.4
Seniors	1.1	7.2	0.0	3.0	0.0	4.0	0.0	3.8	0.5	5.3	0.0	2.4
Lone-parents	F	F	F	F	F	F	15.1	31.9	20.3	39.7	22.0	41.4
Unattached non-elderly	27.7	43.0	14.2	27.2	21.2	35.5	F	F	F	F	F	F
Activity limited	12.9	23.5	8.9	18.4	9.4	18.8	5.0	12.8	5.3	12.7	5.6	13.9
Vancouver												
all people	15.9	19.8	12.3	15.8	13.0	16.6	14.7	19.1	14.8	19.0	14.3	18.7
Children	12.3	20.2	9.8	17.4	10.1	17.7	12.0	22.2	14.4	25.0	12.6	22.8

Table A5.   95% Confidence interval estimates of low-income rates for at-risk groups in cities, 2000 and 2009 (continued)

	2000						2009					
	LICO		LIM		MBM		LICO		LIM		MBM	
	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound	lower bound	upper bound
Seniors	10.8	20.5	3.6	10.6	1.7	8.0	9.4	18.3	10.3	19.2	6.1	13.9
Lone-parents	21.2	39.1	12.5	28.5	12.6	28.5	0.5	18.4	4.2	24.1	1.7	19.8
Unattached non-elderly	28.4	42.4	15.4	27.4	22.3	35.7	F	F	F	F	F	F
Recent immigrants	23.3	39.0	19.0	34.4	18.9	34.3	17.1	35.6	17.1	35.6	17.8	36.1
Activity limited	18.1	29.2	11.2	21.0	11.2	21.2	14.8	26.1	16.1	27.5	13.7	25.0

F too unreliable to be published

Note: The confidence interval estimates allow us to test if difference in low income rates between groups is statistically signficant under the same threshold

For example, under LICO, the 95% confidence interval estimates of low income rates for lone parents living in Montreal were (35.8, 49.8) and (16.4, 30.8) in 2000 and 2009. Hence under LICO, the low income rate declined for them between the two years because the intervals do not overlap. On the other hand, the 95% confidence interval estimate of the low income rate for lone parents living in Edmonton in 2009 was (15.1, 31.9) under LICO. This was statistically indifferent from that of lone parents living in Montreal.

Source: Survey of Labour and Income Dynamics, 2000 and 2009, Statistics Canada.

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